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ACQUISITION REVOLUTION

A Research Paper

Presented To

The Directorate of Research

Air Command and Staff College

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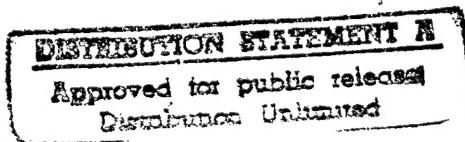
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Preface

The world is experiencing a dynamic period of transition since the end of the Cold War. Characterized by growing ethnic and cultural conflict, increasing proliferation of weapons of mass destruction, and regional instability, the challenges to United States' interests are daunting. Within the US, the military has witnessed rapid down sizing since the Gulf War, significantly reduced defense budgets, and increasing operations tempo worldwide. The US ability to meet these changing threats, within the current constraints, is directly tied to our ability to effectively and efficiently field new weapon systems. This paper addresses the current acquisition system, the problems with the current system, and makes fundamental recommendations for improvement. A national commitment by Congress and the Department of Defense is essential to this improvement. The lives of US forces and combat capability in the future demand it. The time is now.

We would like to acknowledge the support from our research advisor, Maj Phil Chansler, for assisting us in the proper methodology and analysis techniques for our study. He also provided numerous constructive comments during the editing process that served to significantly improve the overall paper. We would like to offer a special thanks to Col John Warden, USAF Retired, for providing us the idea for this research and for his time in meeting with our team.

Additionally, we would like to thank several people who were instrumental in our information search. Lt Col Robert Halbert, SAF/AQLJ, for providing information on

ACTDs and UAV programs. Maj Gail C. Allen, SAF/LLP, for providing comments on the latest congressional initiatives on acquisition reform. Maj Sandra Ludwig, SAF/AQXA, and Mr. Jack Starich, AFAA/FS, for in-depth information on acquisition reform. Mr. Rich Bedarf, Director, F-15 Advanced Development, McDonnell Douglas Aerospace, who provided inputs on our new organization structure.

Abstract

The federal acquisition system has long been inefficient in developing and acquiring advanced weapon systems in a timely fashion. These inefficiencies cost tax payers billions in overruns and delay the deployment of critical military capabilities. The major causes for cost overruns and schedule delays are burdensome laws and regulations, military required specifications and standards, program instability, and congressional micromanagement. While past and current acquisition reform initiatives have reduced some of these inefficiencies, they have not gone far enough. For reform to fulfill its promise, a total reengineering of the existing defense acquisition structure must occur from top to bottom.

The objective of this study is to introduce concepts that will induce a revolution in acquisition affairs and transform the current bureaucracy into an effective and efficient organization that can exploit emerging technologies in the future. To accomplish this, the team analyzed the current acquisition system, identified problems with the system, examined lessons from successful programs, and investigated current acquisition reform initiatives. To support this analysis, the team conducted an extensive literature search and solicited information from acquisition personnel at the Pentagon, Air Force Material Command, Army Material Command, and the Defense Systems Management College.

This research revealed a great need to establish a new defense acquisition system that provides program stability in developing and acquiring weapon systems while being agile

enough to exploit emerging technologies. To create this new structure, this team recommends three fundamental changes that must be implemented collectively.

1. **Completely empower program managers and establish true Integrated Product Teams (IPTs).** The program manager and the program office team are the heart of the acquisition system. This organization must be built around an empowered program manager with ultimate authority for managing the program and a small, integrated government and contractor team committed to rapidly delivering new combat capability.
2. **Reengineer the Requirements Generation Process.** To improve the requirements generation process, the role of the Mission Need Statement (MNS) must be enhanced while the Operational Requirements Document (ORD) must be diminished. The Joint Warfighting Capabilities Assessment (JWCA) must be expanded to enhance the links between technology and military experts. Lastly, the use of modeling, simulation, and prototyping should be expanded for conducting trade-offs between requirements.
3. **Connect DOD and Congress into a symbiotic and effective team.** To provide program stability, there is an urgent need to reduce the level of congressional micromanagement while consolidating congressional reporting requirements for DOD. We recommend reducing committee overlap in Congress and consolidating congressional oversight agencies. Program reporting should also be reduced to once a year and at each milestone decision. Lastly, adopt a long-term planning and budgeting process by implementing multiyear budgeting and appropriations.

Chapter 1

Introduction

I am advocating a Revolution in Defense Acquisition Affairs which will complement the Military Technical Revolution. In short, I am not proposing that we leap the chasm of uncertainty in two bounds—instead, I want to make the giant leap which will put us into a new world. . . .¹

—Col John A. Warden III

Introduction and Problem Definition

The year is 2001 and Iraq has obtained a single nuclear warhead and mated it to an advanced scud missile. Capitalizing on this regional advantage, Iraq has been gaining power in the Arab world and, recently, begun to threaten US interests in the region. The US National Command Authorities (NCA) want the warhead destroyed, but Iraq has threatened to launch the missile toward Israel at the first sign of a US response. US intelligence has located the missile and three F-117 fighter pilots are given the mission to penetrate the Iraqi air defense undetected and destroy the warhead. Lets look at two possible scenarios. In the first, the F-117s enter Iraqi air space, are detected and shot down by surface-to-air missiles. The missiles were guided with radars Iraq modified based on information gleaned from their experience with the F-117s during Desert Storm. Iraq launches the fifty kiloton nuclear warhead which explodes at 10,000 feet over Tel Aviv, killing 150,000 people, and plunging the middle east into a full-scale war.

In the second scenario, the Iraqi radars detect one of the F-117s and shoot it down. The two remaining aircraft reach and destroy the missile because they were slightly different than the first; they were F-118s and their signatures were optimized differently than the F-117s. These aircraft were fielded in less than three years, from contract award to initial operating capability (IOC), in support of a new national strategy. Col Warden refers to this new strategy as a “technological offensive” which involves “developing and fielding a squadron or so of a new weapon system every three to five years.”² Which scenario do we want to reflect reality in the future? The answer is obvious. A more probative question is, “how will the Air Force use technology to create the future we have chosen,” and can we create that future in the current fiscal environment?³

The DOD budget for weapons procurement has been reduced by over 60 percent since its peak in 1986.⁴ Overhead and management control costs account for 40 percent of the reduced budget and the DOD’s regulatory requirements account for another \$15 to \$75 billion, far exceeding the comparable costs experienced by commercial enterprises.⁵ Declining defense spending, escalating weapon system acquisition costs, and inherent inefficiencies in defense acquisition have presented the DOD with a no-win situation. We can no longer afford the type of expenditures that characterized the 1980s.

So what do we cut? Do we mortgage our future by curtailing research and development, or do we endanger the lives of men and women on the line today by cutting the operations and maintenance funding they depend on? This nation should not have to choose between the two. This research team believes the US can have both. We can do it by creating an acquisition process that complements and enables the visions of our military planners by making their visions affordable.

Review of Related Literature

The thesis of this research project is based on the premise that the existing acquisition system cannot meet the challenges expected in the next century and cannot fulfill Col Warden's vision of creating the future we want. The literature related to this premise is focused in two principle areas, the existing acquisition system and problems with the current system. Documentation describing the current system consists, primarily, of government laws and regulations. These laws and regulations are structured in a hierarchical manner. That is, basic guidance flows from the legislative framework provided by Congress and is transmitted and augmented through the executive branch in the form of directives. At the "operational" level, the DOD 5000-series directives provide standardized guidance to each service. Additional guidance, augmenting but consistent with the DOD 5000-series directives, is often issued by subordinate services and commands. This documentation is prescriptive in nature. Literature related to problems with the current system can be found in a myriad of forms ranging from official studies, conducted under private and government sponsorship, to personal commentary found in journals, magazines, and other publications. Most of this literature is both evaluative and analytical in nature. In other words, conclusions are drawn by the authors regarding the "health" and effectiveness of the current system. The literature related to these aspects of the research was investigated to answer three basic questions. How does the current system operate, what are the contextual elements associated with that system, and what are the core problems with the system?

Our working research hypothesis is that root causes of the problems can be identified and then, fundamental changes can be implemented that will create a revolution in

defense acquisition affairs. Literature related to this aspect of the research is generally oriented toward three broad areas. The first area focuses on lessons learned from “successful” acquisition programs. This documentation is historically based and exhibits evaluative and analytical trends. A significant portion of the research involved works that were autobiographical in nature. These works provide subjective “post-mortem’s,” and include impressions, perceptions, and conclusions of people who had directly participated in the programs. *Lockheed Skunk Works*, written by Steve Pace, exemplifies the character of much of this type of literature. The second area of research, current reform efforts, relied heavily on information obtained from governmental sources at the Pentagon, the Defense System Management College (DSMC), and other organizations. Much of the documentation is unpublished and directive in nature. The “Lightning Bolt Initiatives” issued by the Assistant Secretary of the Air Force for Acquisition and the Advanced Concept Technology Demonstration (ACTD) management plan are representative of this type of information. Investigation of these two areas was directed toward answering three questions. Why were some historical programs so successful, what lessons can be applied in today’s environment, and do the current reform efforts offer potential solutions, if more broadly applied?

The final focus of the literature search involved investigation of the current body of academic research into organizational behavior, management principles, management of technology, initiating and managing innovation in organizations and products, and other related topics. *The Technology Payoff: How to Profit With Empowered Workers in the Information Age*, written by Gerald M. Hoffman, and *The Fifth Discipline*, written by Peter M. Senge, provided key insights into new assumptions about people and their roles

in organizations and highlighted some core management principles. *Process Innovation*, by Thomas H. Davenport, provided a framework for defining and implementing organizational innovations. Finally, *Strategic Management of Technology and Innovation*, written by Robert A. Burgelman and Modesto A. Maidique, was key to many of the recommendations focused on identifying and integrating emerging technologies. The goal of research into the current body of academic work was to define the “state-of-the-art” in organizational design and management, and to identify key management approaches and principles that could be applied to foster the needed revolution. While the preponderance of the available academic research is focused on commercial, or profit-oriented businesses, many of the problems faced by civilian industry, including the need to deal with rapidly changing technology, can be directly applied at the principle level, to DOD acquisition.

The literature search provided the academic and practical basis for the analysis required to redefine the acquisition system. Specifically, the research led us to identification of the fundamental problems and the root causes of the problems within the system. Additionally, the literature review and subsequent analysis led us to the recommendations that deal with these root causes.

Research Scope and Methodology

This research effort seeks to fundamentally redefine defense acquisition to meet the challenges expected in the next century. Toward that end, a systematic, qualitative research methodology was followed. Chapters two and three document the investigation of the culture and structure of the current system and identify root causes of existing

problems. Chapter four and five provide an overview of the current reform efforts and lessons learned from successful acquisition programs, identified through an extensive literature search.

The analysis of this research coupled with a thorough review of modern management theories and principles served as the genesis for the recommended innovations. Chapters six through eight outline recommended process innovations in acquisition management, requirements generation, and Congressional resource allocation and oversight. These recommendations are necessary and sufficient to form the foundation for a revolution in defense acquisition affairs that will complement the emerging technical revolution. Gen Gordon R. Sullivan said, “never before has the military been challenged to assimilate the combined weight of so much change so rapidly. In this environment, the payoff will go to organizations which are versatile, flexible, and strategically agile, and to leaders who are bold, creative, innovative, and inventive. Conversely, there is enormous risk in hesitation, undue precision, and a quest for certainty.”⁶ To achieve the reality characterized in the second fictitious scenario above within the current fiscal environment, we must revolutionize defense acquisition. “We must do so by embracing the necessity to muster one bold, giant leap and “cross into the new world, a world dominated by chaos and change.”⁷

Notes

¹ Col John A. Warden III, “A Strategy for the New Age,” presentation to the Air Command and Staff College, Maxwell AFB, Ala., 2 June 1995.

² Ibid.

³ Ibid.

Notes

⁴ Paul G. Kaminski, "The Defense Acquisition Challenge: Technological Supremacy at an Affordable Cost," *Armed Forces Comptroller*, (Winter 1995): 3.

⁵ Ibid.

⁶ Gen Gordon R. Sullivan in Adm William A. Owens, "The Emerging System of Systems," *US Naval Proceedings* 121 (May 1995).

⁷ Col John A. Warden III, "A Strategy for the New Age," presentation to the Air Command and Staff College, Maxwell AFB, Ala., 2 June 1995.

Chapter 2

Current Acquisition System

Traditional acquisition practices created to support a Cold War mobilization base and large standing force limited our access to the best and most modern technologies and program management processes. As our business and acquisition costs and cycle times increased, the gap widened between the operational capability we had and what technology could offer.¹

—Dr. Kenneth J. Oscar

Introduction

To successfully undertake the challenge of redefining the acquisition system, it's imperative to understand the existing system and processes. The current system can be described in terms of its framework, the procurement process, and the management environment within which the whole operates. This overview provides a general understanding of key elements of defense acquisition that is necessary before meaningful innovations can be proposed and evaluated.

Framework

The authority for the Department of Defense (DOD) to develop, produce, and field weapon systems flows from four principle sources.² These sources are Public Law,

Executive Direction, the Federal Acquisition Regulation, and Office of Management and Budget (OMB) Circulars.

Public law includes legislation passed by Congress and signed by the president. Examples include the Small Business Act of 1958, Competition in Contracting Act of 1984, and the authorizations and appropriations acts each fiscal year.

Executive Direction promulgates and augments public law. This direction is communicated through executive orders, national security directives, and departmental and agency regulations. Examples include Executive Order 12352, National Security Directive (NSD) 219, and National Security Review (NSR) 11. Executive Order 12352 directed procurement reforms and establishment of the Federal Acquisition Regulations. NSD 219 directed implementation of recommendations of the President's Blue Ribbon (Packard) Commission on Defense Management. NSR 11 directed the Defense Management Review and subsequent Defense Management Report to the President in 1986.³

Beyond Public Law and Executive Direction, additional high level guidance flows through the Federal Acquisition Regulation (FAR). The FAR governs acquisition with appropriated funds for all federal agencies. The FAR standardizes regulatory guidance between federal agencies including contract-award procedures, acquisition planning requirements, and warranty provisions. In addition to the FAR, the DOD has supplemented the requirements for DOD acquisition and codified it in the Defense Federal Acquisition Regulation Supplement (DFARS).

DOD authority can also be found in OMB Circular A-109 which defines the system acquisition process and establishes basic acquisition policy for federal agencies. These

policies include requirements to express needs and objectives in mission terms, emphasize competitive exploration of alternative design concepts, communicate with Congress, establish clear lines of management authority, designate a program manager for each major program, designate an agency acquisition focal point, and avoid premature commitment to full scale development and production.⁴

Implementation of OMB Circular A-109 within the DOD has been accomplished through the “5000-series” directives for major and non-major systems. DOD Directive 5000.1 is the principle source of broad policy directives for DOD acquisition managers. It “establishes a disciplined management approach for acquiring systems and materiel that satisfy the operational users’ needs.”⁵ It contains acquisition policies that “establish a disciplined approach for integrating the efforts and products of the Department’s requirements generation; acquisition management; and planning, programming, and budgeting systems.”⁶ This approach provides for translating operational needs into stable, affordable programs, acquiring quality products, and organizing for efficiency and effectiveness.

Procurement Process

Translating operational needs into stable, affordable programs is accomplished through long-range planning, evolutionary requirements definition, and the milestone-phases of the acquisition process. DOD Directive 5000.1 directs each component to develop broad long-range investment plans. The plans must be based on the best estimate of future top-line fiscal resources and form the basis for affordability assessments.

The second element involved in translating needs into affordable programs is the evolutionary requirements definition process. DOD Directive 5000.1 dictates mission needs be stated in broad operation capability terms and that each need be assessed to determine if non-materiel solutions exist that can satisfy that need. If non-materiel solutions do not exist a new start acquisition program must be initiated. According to DOD Directive 5000.1, “Once approved as a new start acquisition program, operational performance requirements for the concept(s) selected shall be progressively evolved from broad operational capability needs to system-specific performance requirements (e.g., for range, speed, weight, payload, reliability, maintainability, availability, interoperability).”⁷ These operational performance requirements ultimately become the principle source of system specifications and serve as the final basis for measurement of success. It must be noted that the DOD Directive 5000.1 process is threat-based. It directs that, “intelligence threat assessments be produced, approved, and validated for use by acquisition authorities to ensure that each system developed is mission-capable in its intended operational environment.”⁸

The final element in moving from operational needs to affordable acquisition programs is the milestone phases of the acquisition process. DOD Directive 5000.1 directs “the acquisition process be structured in discrete logical phases separated by major decision points, called milestones.”⁹ DOD 5000.2 defines the acquisition process and major milestone decision points and is depicted in Figure 1.

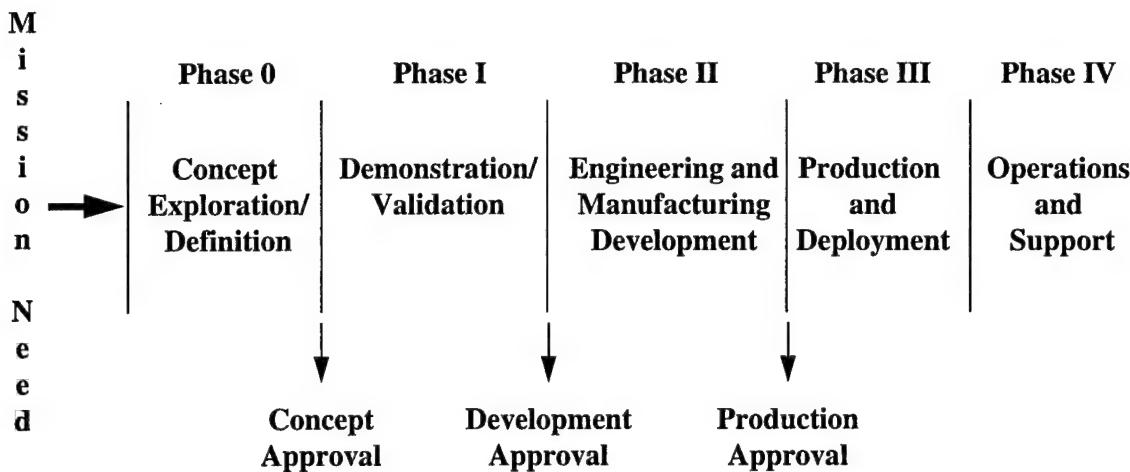


Figure 1. Acquisition Milestones

The milestone process is systematic with multiple decision opportunities. At each decision point, threat projections, life-cycle costs, cost-performance-schedule trade-offs, affordability constraints, and risk management are major considerations.

Management Environment

According to DOD Directive 5000.1, “effective acquisition planning and aggressive risk management by both government and industry are essential for acquiring quality products.”¹⁰ “Program decisions and resource commitments must be based on plans for, and progress in, controlling risk.”¹¹ Acquisition planning includes development of acquisition strategies and program plans. These planning documents must be structured to meet objectives and control risk. Risk management is part of the overall planning process. “Program risks and risk management plans shall be explicitly assessed at each milestone decision point prior to granting approval to proceed into the next acquisition phase.”¹² DOD Directive 5000.1 provides additional direction in the following areas: contract type selection; program objectives and baselines; competition and source

selection; and contractor management information systems. This additional direction is aimed at facilitating risk management and overall management control.

The final focus of DOD Directive 5000.1 is organizing for efficiency and effectiveness. DOD Directive 5000.1 attempts to establish short, clear lines of authority and accountability, provides for an independent operational test activity, addresses acquisition corps requirements, prescribes the tenure of key officials, and deals with the development of acquisition policies and procedures.

Part two of DOD Directive 5000.1 describes the integrated management framework envisioned in Part one. “This framework is intended to provide the basis for developing and publishing acquisition management policies established by this directive that are consistent with and support the requirements generation system and the planning, programming, and budgeting system.”¹³ From this basis, each service develops policies and instructions to implement and supplement the 5000-series requirements. The Air Force, for example, has issued over a hundred policies, instructions, and handbooks relating to the acquisition process. This plethora of guidance dictates the detailed day-to-day management, reporting, and coordination requirements faced by the program manager.

Conclusion

This chapter provided an overview of the current acquisition system by addressing the framework in terms of top-level guidance, the procurement process, and the environment in which weapon systems are acquired. While this overview does not provide an exhaustive treatment of the defense acquisition system, the complexity of the

framework is apparent. The myriad laws and regulations stem from historical experience and are aimed at authorizing, restricting and controlling the actions of acquisition managers.¹⁴ It is with this framework that we can now examine the historical problems with this system.

Notes

¹ Dr Oscar, Kenneth J. (1995, September/October). Affordable Acquisition. RDA Magazine [Online], 9 paragraphs. Available HTTP: <http://www.army.mil/aac-pg/pub/rda/koscar.htm> [1995, November 15].

² C.B. Cochrane, "Student Volume 1," teaching notes, Defense Systems Management College, Fort Belvoir, VA, June 1993.

³ Ibid.

⁴ Ibid.

⁵ DOD Directive 5000.1, *Defense Acquisition*, 23 February 1991.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ C.B. Cochrane, "Student Volume 1," teaching notes, Defense Systems Management College, Fort Belvoir, VA, June 1993.

Chapter 3

Problems with the Current Acquisition System

The problem is that DOD's acquisition system is a complex web of laws, regulations and policies, adopted for laudable reasons over many years. If there were any doubt that the current system exacts a significant cost in terms of performance, quality, innovation and prices the government pays, one need only ask the government's senior acquisition executives.¹

—William J. Perry
Secretary of Defense

Introduction

The DOD is experiencing its tenth year of a declining defense budget coupled with ever increasing scrutiny from Congress. Table 1 below shows this relationship. Within this environment is an acquisition system that has difficulty providing weapons systems cost-effectively or to quickly exploit advancing technology. Much of this can be attributed to the instability that the current system imposes on developing and acquiring weapon systems. Having examined the current acquisition system, this chapter focuses on specific problems with acquiring weapon systems and identifies the associated causes within the current bureaucracy.

Table 1. DOD Budget Authority vs. Congressional Reports

Fiscal <u>Year</u>	(Dollars in Billions)			
	Current <u>Dollars</u>	Constant <u>Dollars</u>	Real Growth <u>Percentage</u>	Congressional <u>Reports</u>
85	286.8	402.2		458
86	281.4	384.6	-4.4	676
87	279.5	370.3	-3.8	680
88	283.3	362.6	-2.1	719
89	290.8	357.5	-1.4	661
90	293.0	349.7	-2.2	861
91	276.2	314.5	-10.1	676
92	281.9	314.7	-0.0	734
93	267.4	289.3	-8.1	654
94	251.4	264.8	-8.5	676
95	252.6	259.7	-1.9	709

FY 1985-95 real change: -39%

Source: OSD Under Secretary of Defense (Comptroller)²

Problems

Program cost overruns and schedule delays are the central problems of developing and procuring weapon systems. During the past four decades, numerous researchers and presidential commissions have identified many instances of cost overruns and schedule delays, and repeatedly concluded that opportunities exist to save billions annually by improving the acquisition system. Secretary Perry told the House Armed Services Committee in early 1994 that by changing the current acquisition system, "we have the potential . . . for savings of \$10 billion a year by fiscal year 1999."³ Savings of this magnitude could represent about 10 percent of defense procurement outlays by the end of the decade.

A 1986 study found that nearly half of all major acquisition programs have experienced schedule delays of approximately 33 percent. Also, more than nine in ten programs have exceeded budgeted costs and the average cost increase for a majority of

programs has been more than 50 percent.⁴ Examples of programs with significant cost overruns up to 1981 include the Navy's Trident (\$33 billion increase), the Air Force's F-16 (\$33 billion increase), and the Army 's M-1 tanks (\$13 billion increase).⁵

In a recent DOD-sponsored review of 24 major acquisition programs of all types, 18 came in under a 100 percent cost overrun and schedule delay. For all 24 programs reviewed, the average cost overrun in the Engineering and Manufacturing Development phase was 45 percent over the program's budgeted costs, and the average schedule overrun was 63 percent over the program's planned schedule.⁶

In addition to the high costs and schedule delays described above, the current DOD development and production cycle takes too long. The design cycle for commercial technology is approximately three to four years as compared to eight to ten years in DOD. As a result, many DOD systems are technologically obsolete by the time they are fielded.⁷ For example, a recent Navy study showed that by strictly following the existing acquisition process, it could take more than 23 years to go from identifying the need for a new weapon to initial deployment of the system.⁸ In today's environment when technology is doubling every several years, a lengthy system development denies the US the opportunity to utilize and exploit the most advanced technologies. As Mr. Paul G. Kaminski, Under Secretary of Defense for Acquisition and Technology, said in his 29 November 1994 speech to the American Society of Military Comptrollers, "In DOD, we cannot afford a 15-year cycle time when the commercial turnover is every 3-4 years . . . the military advantage will go to the nation which has the best cycle time to capture what is available commercially, get it incorporated in weapon systems, and get it fielded."⁹

Root Causes

Studies of the defense acquisition system have identified laws and regulations, military specifications and standards, program instability, and congressional micromanagement of defense spending as the major contributors to cost overruns and schedule delays.

Laws and Regulations

Laws and regulatory requirements add premium cost to items sold to the government without adding commensurate value. A 1992 survey revealed that the DOD pays a premium of 30 to 50 percent more for products than the same or similar items sold to a commercial enterprise.¹⁰ This survey attributed the cost premium to laws, regulations, military specifications and standards, and procurement practices. An additional study by Coopers & Lybrand found 18 percent of the estimated cost premium was associated with the military required specifications and standards, and the Truth in Negotiations Act, which requires contractors to maintain detailed cost information.¹¹

One of the common complaints from defense contractors has been that doing business with the government is difficult, time consuming, and costly, as compared with commercial practices. These unique laws and regulations include government cost accounting standards, the requirement to provide product cost data, record keeping and reporting requirements, audit and oversight requirements, access to competitively sensitive financial data, socioeconomic and mandatory source requirements, requirements for rights in technical data, and security requirements. According to Ms Colleen A. Preston, Deputy Under Secretary of Defense for Acquisition Reform, the DOD

acquisition system has been based on a foundation of meeting some important goals, which add complexity and time to the acquisition process. These goals include: ensuring the acquisition process is fair; preventing fraud, waste and abuse; standardizing treatment of contractors; ensuring that the government receives a fair and a reasonable price when buying products that are not commercially available or competitively available; checks on government's demands upon its suppliers; and furthering socioeconomic objectives. These demands, while valid goals of our acquisition process, add up to something so complex that it becomes a minefield in which to navigate in trying to accomplish the objective.¹²

The Truth in Negotiations Act requires contractors to maintain accounting data based on cost for every product. Commercial companies do not track their costs on a product-by-product basis and therefore, costs of creating that accounting system are added to product costs. Some companies are finding they can not afford these added costs and remain competitive. For example, a company was planning to introduce a radio with special encryption features sought by the DOD. Because the item had not been sold in substantial quantities to the public, it could not qualify for an exemption to DOD's requirement that the company provide cost data. Since the company did not generate such information for its commercial customers, it would have had to set up a new accounting system to track and verify the information if it wanted to sell the radios to DOD. It could not afford to do that. The result was the DOD was stuck buying old technology while commercial customers bought the new, more capable radios.¹³

Military Specifications and Standards

Military specifications and standards also add to program costs. Military specifications were adapted to ensure the DOD obtains a quality product that meets the users' needs while using a procurement process that allowed it to buy from the lowest bidder and to ensure standardization. With a procurement budget that has declined more than 60 percent since Fiscal Year 1985, the DOD can no longer afford the luxury of maintaining a totally defense-unique industry.¹⁴ According to Gen Merrill A. McPeak, former Air Force Chief of Staff, one problem is that the military worried about new systems meeting extremely detailed specifications. Programs starts, stops, stretches, and changes in program milestones caused by obsession with specifications drive costs "out of sight."¹⁵

Reform of military specifications and standards is one of the keys to achieving cost savings. Military specifications and standards increase production costs, lengthen product development cycles, and destroy incentives for innovation. As a result, Secretary Perry called for the use of commercial specifications in the absence of a compelling reason to require military specifications. Similar to Ms Colleen A. Preston's assessment of the existing acquisition system, Secretary Perry states that while each rule individually has (or had) a purpose for its adoption and may be important to the process as a whole, it often adds no value to the product itself and when combined, contributes to an overloaded system that is often paralyzed and ineffectual, and is at best cumbersome and complex.¹⁶

Program Instability

Program instabilities such as changing requirements, schedules, and unexpected budget changes result in significant additional costs for programs. The RAND Corpora-

tion concluded that the weapons procurement process too often results in frequently changing program budgets and schedules.¹⁷ Similarly, in 1983, the Air Force conducted a study to find ways to shorten the acquisition process and procure weapons at a lower cost. This study reviewed cost and schedule history of 109 acquisition programs, and concluded that program instability (changes to program funding and schedule) is the major causative factor of cost and schedule growth.¹⁸

In June 1989, then Secretary of Defense Dick Cheney released the Defense Management Report (DMR) outlining plans for improving defense acquisition. The DMR concluded the DOD must adopt certain management principles, one being stability in programs. "Reliable planning, funding, and system configuration, and continuity in management personnel, greatly increase the likelihood that systems will be delivered on time and at projected costs."¹⁹

Gen Ronald W. Yates, former commander of Air Force Materiel Command, also identified the continuing budget instability in Congress, which changes future funding plans on a yearly basis, as a major problem in the acquisition system.²⁰ General Yates pointed out a program such as the F-22 fighter, although hailed as a model acquisition program, still faces an annual scramble for funding. Cutbacks or delays in approving funds frequently disrupt the development or production process, thereby increasing the ultimate weapon system costs. In particular, funding uncertainty makes long term production planning extremely difficult and decreases the probability that contractors will benefit from any attempt to reduce production costs or increase productivity or both. Consequently, production costs remain high.²¹ According to the Blue Ribbon Commission of 1986, successful commercial programs enjoy dependable resource

commitments from upper management.²² Thus, program stability is necessary for an effective and efficient DOD acquisition system.

Congressional Micromanagement

Congressional micromanagement is one of the program manager's greatest complaints. As a result, program managers spend too much time ensuring compliance with regulations, responding to audits, and briefing organizations with marginal program involvement. The Blue Ribbon Commission noted that the program manager spends a very high percentage of his time briefing his program, writing reports on his program, and defending his program, thus doing everything except managing his program.²³

Congressional micromanagement was also blamed by General Yates, in a 13 September 1993 Air Force Times article by Neff Hudson, for the current acquisition system's inefficiencies. General Yates believes the acquisition system is being crippled by politics. For example, when Congress decides to allocate funding for a major program, it often attaches a list of conditions that must be met before the money can be spent. Lawmakers defend these "congressional hooks" as a means to ensure accountability, but many defense industry officials see it as unnecessary interference that wastes time and money. General Yates noted that "there is almost an order of magnitude increase in the micromanagement each year. It is unchecked and growing."²⁴

By micromanaging defense spending on an annual basis, Congress has created an unstable acquisition environment and with it all the hidden costs that instability imposes. It is very difficult to develop and successfully implement a long term plan for acquiring a weapon system if funding changes from year to year. In order to keep pace with annual funding changes, program managers are constantly revising program requirements and

schedule, which ultimately leads to contract changes. This instability costs the tax payers millions from lost productivity and hurts the military services by delaying the fielding of critically needed weapon systems.

Conclusion

This chapter examined the problems with weapon system acquisition and identified the major factors within the current system that cause the problems. The development and procurement of weapon systems continue to experience cost overruns and schedule delays. This can be attributed to burdensome laws and regulations, military required specifications and standards, program instability in the form of changing requirements and funding profiles, and the ever increasing congressional involvement in program management issues. The next chapter will look at selected historical acquisition programs that were successful because the systematic problems discussed above had not yet fully matured.

Notes

¹ "Acquisition Reform: A Mandate for Change," *Defense Issues* 9, no. 10 (1994): 4. (Reprinted from the Acquisition Reform document that Secretary of Defense William J. Perry provided to the House Armed Services Committee, 9 February 1994, and to the Senate Armed Services and Governmental Affairs committees, 24 February 1994.)

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Chapter 4

Lessons from Selected Acquisition Programs

More than half a dozen times over the past fifty years of cold war we have managed to create breakthroughs in military aircraft or weapon systems that tipped the strategic balance of power for a decade or longer, because our adversaries could not duplicate or counter what we had created. That must continue to be our role into the next century, if we are to preserve what we have accomplished and be prepared for the hazards as well as the opportunities for the uncharted risky future.¹

—Ben Rich
Team Leader, Lockheed Skunk Works

Introduction

The previous sections described the current acquisition process and identified problems with the current system. Despite the complexities and associated problems of the system, many “success” stories do exist. These successes sometimes followed different rules, but all employed guiding principles of efficiency. They were also mostly unfettered by such problems as we have identified with the current procurement system: laws and regulations, military required specifications and standards, funding instability, and bureaucracy. The following case studies highlight the principles of efficiency and the environment needed to produce weapon systems within our desired window of five years.

Aircraft

Skunk Works

Perhaps the best example of an organization that has transformed new technologies to military hardware efficiently is the Lockheed Advanced Development Company (LADC), or more commonly referred to as the Lockheed Skunk Works. The company produced the P-80 which was the first operational US jet fighter, followed by the F-104. After these aircraft came the highly successful U-2, followed by the extremely technical SR-71 Blackbird which was, and still is in many respects, more technically advanced than many aircraft.² Behind the success of the SR-71 came the development of the stealthy F-117 which, even in small numbers, proved to be a large force multiplier in Desert Storm. By capitalizing on superior technology and efficient development processes, radically new systems were developed and fielded in just a few years.

Our research of the Lockheed Skunk Works focused on the development process of the organization. The Skunk Works organization was led by Mr. Kelly Johnson who proved to be a visionary in the organizing and affecting of development and production processes. He was not only technically competent, but an effective manager as well. He did not necessarily develop all the ideas for his projects, but rather relied on concepts from research laboratories, think-tanks, and development offices.³ He successively transformed and integrated new technologies into workable military applications. In 1943 when the Skunk Works was created, Mr. Johnson was able to select the best of the company's engineering talent for an experimental department. Design engineers, mechanics, and assembly technicians worked together in a streamlined fashion, free from

constraints imposed by the company as a whole. The department was completely independent of the rest of the company for purchasing and all the other support functions.⁴ Within this environment, Mr. Johnson was able to efficiently develop all the new high-tech aircraft from his department. Johnson's organizational philosophy was summarized in his basic operating rules:⁵

1. The Skunk Works manager must be delegated practically complete control of his program in all respects. He should report to a division president or higher.
2. Strong, but small project offices must be provided both by the military and industry.
3. The number of people having any connection with the project must be restricted in an almost vicious manner. Use a small number of good people (10 to 25 percent compared to the so-called normal systems).
4. A very simple drawing and drawing release system with great flexibility for making changes must be provided.
5. There must be a minimum number of reports required, but important work must be recorded thoroughly.
6. There must be a monthly cost review covering not only what has been spent and committed but also projected costs to the conclusion of the program. Don't have the books ninety days late and don't surprise the customer with sudden overruns.
7. The contractor must be delegated and must assume more than normal responsibility to get good vendor bids for subcontract work on the project. Commercial bid procedures are very often better than military ones.
8. The inspection system as currently used by LADC, which has been approved by both the Air Force and Navy, meets the intent of existing military requirements and should be used on new projects. Push more basic inspection responsibilities back to subcontractors and vendors. Don't duplicate so much inspection.
9. The contractor must be delegated the authority to test his final product in flight. He can and must test in the initial stages. If he doesn't, he rapidly loses his competency to design other vehicles.
10. The specifications applying to the hardware must be agreed to in advance of contracting. The LADC practice of having a specification section stating clearly which important military specification items will not knowingly be complied with and reasons therefore is highly recommended.
11. Funding a program must be timely so that the contractor doesn't have to keep running to the bank to support government projects.
12. There must be mutual trust between the military project organization and the contractor, with very close cooperation and liaison on a day to day basis. This cuts down misunderstanding and correspondence to an absolute minimum.
13. Access by outsiders to the project and its personnel must be strictly controlled by appropriate security measures.

14. Because only a few people will be used in engineering and most other areas, ways must be provided to reward good performance by pay not based on the number of personnel supervised.

Mr. Johnson's operating rules are a primary reason for the success of the Skunk Works. A program manager given complete control of a project, to include budget and personnel, without higher management or congressional intervention is clearly opposite to what the PM must deal with today. Additionally, Mr. Johnson's success depended on a small team with tight coordination between management, engineering, and manufacturing while working closely with the government.

F-104

As mentioned, the Lockheed F-104 was a highly successful Skunk Works product, requiring only five years from program initiation to operational use.⁶ A few details of its development reveal how the Skunk Works operating procedures combined with government trust and support led to rapid production.

The pace of the F-104 program was blistering. Contract negotiations began early in 1953 with a simple letter contract approved by the Air Force in March for the procurement of two prototypes, spare parts to support 100 flight test hours, mock-ups, and wind tunnel models.⁷ Construction of the prototypes began immediately and the first flight was 11 months later, one month earlier than planned. A contract was signed in November 1953 for two prototypes to be delivered by March 1955.⁸ After the prototypes were tested, contracting continued and production lines were set; F-104s soon began to roll off them. By early 1958, five years after program initiation, interceptor squadrons were flying the F-104.⁹ Its airspeed provided a vital combat capability to US defense and its production speed provided that capability in a timely manner.

This expeditious production was due not only to the genius of Kelly Johnson, but also to government support for the program. First, latitude to operate gave Lockheed a free hand in the development of the XF-104. Requirements were issued nearly simultaneously to the contract and imposed few constraints or details.¹⁰ Second, the program was not slowed by governmental micromanagement or bureaucratic oversight. Third, expeditious contracting saved time which was possible due to streamlined lines of authority and trust. Finally, the F-104 was given priority in wind tunnel testing.¹¹ The National Advisory Committee for Aeronautics (National Aeronautics and Space Administration's predecessor) was interested with the testing outcome and therefore allowed a disproportionate amount of time and scheduling priority for the F-104 in their wind tunnels.

The F-104 was a success because it avoided many of the problems that now plague acquisition. The PM had a small, empowered team, free from excessive rules, oversight, and binding requirements. The PM also operated with a solid budget, had freedom to innovate, and was provided full government support.

F-100

The North American F-100 was another aircraft that took less than five years from development to operational deployment. In contrast to Lockheed, North American pushed for early production lines and used commercial “off the shelf” components to shorten the procurement cycle. Even though these different procedures were used, a similar atmosphere of trust, support, sense of urgency, and efficient management is evident. Although the F-100 program had its problems, overall it was highly successful and its quick acquisition provided a much needed tactical capability.

As with the F-104, the F-100 program proceeded rapidly due to expeditious contracting resulting from strong government support. In November 1951, North American won a selection process to produce two prototypes for the F-100, winning the competition because of a head start provided by independent work done in 1950 on upgrading their F-86.¹² A contract was signed January 1952, with delivery of the prototypes to be made by December 1953. Several amendments were made to the initial contract during 1952 which increased the size of the buy and authorized fabrication of production tooling.¹³ The first full production model was due only six months after the first prototype. In fact, all the first F-100s were to be delivered before flight testing was complete. Even the prototype itself was a production line product built on hard tooling.

While these decisions to purchase large numbers of the F-100 and early production tooling seemed premature, the feeling was that the risk was low because of trust in North American and because there were no major technological advances in the aircraft.¹⁴ Additionally, the Air Force was given confidence because North American already had an F-100 mock up, from their previous independent work, at contract initiation.¹⁵ The schedule was modified some in September through November 1952, after several Air Force generals voiced concern about the speed of the program and lack of time to adjust for problems seen during testing. However, production was not slowed significantly.¹⁶

The first YF-100A flight was in May 1952, 16 months after the initial implementation decision. As some feared, testing revealed problems with the F-100, but instead of stopping or slowing the program, new variants were proposed with contracts quickly following. A letter contract for 230 F-100Cs was signed in February 1954 followed by a definitive contract in June for 564.¹⁷ The first squadron delivery of A

models was in September 1954. A significant aerodynamic instability was revealed shortly thereafter grounding all F-100As, but even this setback did not significantly slow production.¹⁸ North American retrofitted the grounded aircraft and modified the production line. The retrofits were complete by August 1955 and the first wing of F-100As were operational by June 1955, four and a half years after development began. In the end, over 1000 C, D, and F models were delivered by the end of 1956 and nearly all requirements were met.¹⁹ The program had been quick and low cost.

The F-100 program illustrates the faults of premature production tooling and insufficient early testing. Even with these problems, it was deployed in less than five years. This was due to limited personnel involved, managers with authority to make decisions, few regulations, more liberal specifications, and little micromanagement from above. Again, today's problems were non-existent or avoided.

Missiles

Ballistic missiles are another major weapon system that were acquired quickly when the program was run correctly. Three missiles that were operational within five years of program initiation were the Polaris, Jupiter, and Thor, acquired by the Navy, Army, and Air Force respectively. For the procurement of these missiles, all three services set up special agencies to run the programs. All placed these agencies in relatively high positions within the overall service organization, authorized first choice of people, provided unusual authority over supporting agencies, allowed exemption from normal procurement channels, gave direct access to high officials, and made available special financial support. A single person was given authority over personnel, materials,

facilities and funds. The projects were significant for the national defense effort and had high priority within their services.²⁰ This combination of privilege and empowerment enabled these complex weapon systems to be fielded quickly and effectively. These special agencies were quite similar to Kelly Johnson's Skunk Works in their management and consequently achieved great results.

Polaris

To acquire a fleet ballistic missile capability, the Navy created the Special Projects Office (SPO) in 1955. This office reported directly to the Navy Ballistic Missile Committee which was chaired by the secretary of the navy.²¹ The SPO determined the phasing, directed the technical effort, and evaluated the performance of the Polaris program. The program was still under joint chiefs of staff, the National Security Council, and the office of the secretary of defense for supervision and budgetary control, but had wide authority.²²

Admiral Raborn, the SPO chief, was given the authority, priority, and funds to do what was necessary to get the Polaris program started and keep it moving.²³ An extra impetus was provided by the secretary of defense when he requested the initial 1963 Polaris deployment date be pushed up to 1960. The Navy and contractors began parallel development and production, thus shortening the acquisition process.²⁴ Time was also saved as the SPO used simplified milestone reporting procedures. Additionally, schedule extensions were avoided by the Navy freezing the weapon system design at a performance level which had a realistic completion date versus adding costly time consuming improvements that were continuously proffered by the military industry.²⁵ All these measures added to the program's success, but the most unique feature of the Polaris

program was that it was handled as an in-house operation.²⁶ This meant avoidance of lengthy approval processes thereby allowing action to be taken immediately after the SPO made decisions. Operational deployment was achieved by 1960 versus 1963, and all because it was properly supported, had clear, short lines of authority, and was isolated from bureaucratic oversight and regulation.

Jupiter

The Army's Jupiter program was also developed under a special office, the Army Ballistic Missile Agency (ABMA) at Huntsville, Alabama, established in 1956.²⁷ This agency was also highly effective due to the support it was afforded and the empowerment it was allowed.

The agency's commander, General Medaris, had direct access to the Army chief of staff, the secretary of the Army, and the National Aeronautics and Space Administration. In addition to a direct line of command, Medaris was delegated extensive authority. He was able to issue instructions in his own name to all Army agencies and could award contracts and appoint his own contracting officers. He had authority to deviate from Army procedures and regulations as well as armed services procurement regulations.²⁸ Medaris was further aided by the Armed Forces Construction Authority Act of 1953 which gave him the right to acquire or lease land, buildings, facilities, and machine tools that were required.²⁹ The prompt use of these powers resulted in a striking reduction in lead time and literally allowed the ABMA to complete some major procurement actions in a few hours.³⁰ The bottom line is that by January 1958, the Army had launched the United State's first satellite, Explorer I.³¹

Overarching authority had been delegated to General Medaris as program manager and the restrictive regulations of that time were circumvented. The result was a significant US capability acquired within five years.

Thor

The Air Force's Thor was deployed as a squadron of fifteen missiles to England just three years after program initiation while exceeding performance standards.³² This missile program also profited from national priority and proper management.

The Air Force's management style was aimed at compressing development through the concept of concurrence. This meant overlapping research and development, production, launching facilities build up, training, and the first operational unit deployment which would provide feedback to further research and development.³³ Top research and industrial firms were brought in to work with the Air Force management team. In this approach, management abandoned the step-by-step procedure in favor of simultaneous development, testing, and production.³⁴

Time was saved producing these missiles not only because of the management framework, but also because of the frame of mind. A sense of urgency was felt by all those involved. In the Thor program, the Air Force board reviewed the possible companies for their capabilities. A company was decided upon and within two days was approved by Air Material Command, the Air Research and Development Command, the air staff, and the secretary of the Air Force. The normal time from industry proposal to winner notification was six to eight weeks, Thor took less than three weeks.³⁵ From here, Donald Douglas was notified on 24 December 1955 relaying his company's selection; contract papers were ready by 28 December.³⁶

The Thor program also benefited from teamwork and a streamlined management chain. For example, the Air Force at times authorized the prime contractor to coordinate the program because of his inherent expertise.³⁷ Because it was a priority program, there was a “red line” running directly from the project officer [manager] to the Air Force chief of staff and secretary of the Air Force.³⁸ This streamlined management chain ensured timely decision making throughout the acquisition process.

Conclusion

This chapter presented case studies on successful acquisition efforts which offer several imperatives to a new system. The Lockheed Skunk Works excelled in turning new technologies into military applications. This was accomplished through a program manager with complete authority, a streamlined acquisition team on the part of industry and government, and the importance of a good government-industry relationship. The F-104 and F-100 programs highlight contrasting approaches to manufacturing that were each successful. The F-104 and F-100 programs had contrasting manufacturing approaches, but were successful because of Skunk Works management and positive instead of overbearing government influence.

The missile programs for the Army, Navy, and Air Force also shared common themes. All enjoyed high visibility and the associated support from government leadership. This support led directly to program funding stability and release from the normal oversight and control. Individual program managers were delegated significant authority and responsibility to execute their programs. All of these examples display

lessons that diametrically oppose the root problems of today's acquisition system, and therefore must be considered as we develop recommendations to improve the system.

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Chapter 5

Current DOD Acquisition Reform

Acquisition reform is really only about two things: getting high quality equipment to the war fighter cheaper than we have in the past, and decreasing cycle times so we can take advantage of technology.¹

—Mrs. Darleen Druyun
Acting Air Force Acquisition Executive

Introduction

The last two chapters discussed problems with the current acquisition system and programs that were successful because they avoided many of the complexities of the current system. This chapter traces the origins of the current defense acquisition reform effort and reviews major reform initiatives which aim to regenerate the operating environment the “successes” enjoyed. Beginning with the executive level, we’ll trace this effort through the Office of the Secretary of Defense (OSD) and provide insight on Air Force efforts as an example of service-level reform. The efforts of the Advanced Research Project Agency (ARPA) will also be examined as a potential input to recommending changes in the acquisition process.

Executive Level

The roots of the current acquisition reform campaign can be found in two principal sources, the Clinton administration's National Performance Review and congressional legislation. In 1992, President Clinton was elected based on a campaign which included a pledge to "Reinvent Government." Shortly after taking office, Vice President Gore took the first steps towards fulfilling the administration's pledge by launching the National Performance Review; a comprehensive review of all Departments within the executive branch of the Federal government to identify specific areas needing reform. Not surprisingly, the review of the DOD reaffirmed the well established need for defense acquisition reform noted most recently during the mid and late 1980s in the Packard Commission Report and the Defense Management Review (DMR).

To lead the Administration's effort to restructure the Armed Forces and reform the way the Pentagon does business, President Clinton appointed Dr. William Perry, a noted defense expert, first as Deputy Secretary of Defense, and subsequently as Secretary of Defense. One of Dr. Perry's first actions upon assuming office was to restructure the OSD staff and establish a Deputy Under Secretary of Defense for Acquisition Reform. This office, headed by Colleen Preston, was tasked to develop and implement a coherent and practical step-by-step plan for reengineering each segment of the acquisition system. In addition, the office is responsible for ensuring implementation and institutionalization of approved changes.²

In testimony before the House Government Reform and Oversight Committee in February 1995, Deputy Under Secretary Preston laid out why we must reengineer DOD's procurement system, illustrated the vision for the DOD's acquisition system, and

described initiatives the Department is undertaking in pursuit of the vision. First, Secretary Preston stated that we must totally reengineer the acquisition process now to make it responsive to the external changes in the world. According to Secretary Preston, "DOD faces new national security challenges, a drastically reduced budget, reduced influence in the marketplace and technology that is changing faster than the (current) system can respond."³

With the end of the Cold War, we are now faced with mostly regional or limited conflicts and the potential proliferation of weapons of mass destruction. Over the past 10 years, the overall defense budget has been reduced by 40 percent, but the procurement accounts have been reduced by 65 percent.⁴ During this same period, the commercial sector has replaced the defense sector as the leader in developing new and improved technologies. Technological advancements are now occurring in the commercial sector at a rate that our current acquisition system cannot keep up with. Additionally, many companies in the commercial sector are unwilling to change their business practices to comply with government-unique requirements because the DOD market is simply too small. Finally, even if DOD could find a way to purchase new high tech products from commercial companies, the length of our current acquisition process leads to cases where we field new systems with outdated technology.⁵ This is particularly true of new information-age technologies.

Given the need to reform defense acquisition, Deputy Under Secretary Preston announced a vision which provided direction for reform initiatives and a focal point for defense acquisition. The vision states:

The primary mission of the acquisition system is to meet war fighters needs, and we must never forget that meeting the customer's need is paramount. We will be the world's smartest buyer, continuously re-inventing the acquisition process while taking maximum advantage of emerging technologies that enable business process re-engineering. We will procure best-value goods and services by buying from world class suppliers, predominantly in the commercial marketplace, and by using commercial practices. We will deliver efficiently and on a timely basis by reinventing the acquisition system to make DOD a world class customer. . . .⁶

The second force behind the current acquisition reform campaign is Congress. While the Executive Branch struggled to implement Packard Commission (1986) and DMR (1989) recommendations, the Senate Armed Service Committee (SASC) pushed for additional recommendations from the Defense Department for streamlining the acquisition process. In 1990, frustrated with the lack of responses from the DOD, Senator Jeff Bingaman of the SASC initiated legislation labeled Section 800 of the National Defense Authorization Act for Fiscal Year 1991, which required the DOD to establish an Advisory Panel on Streamlining and Codifying the Acquisition Laws. In 1993, the independent advisory panel issued its report recommending the elimination or consolidation of several hundred statutes.⁷ The advisory panel's recommendations ultimately led to the enactment of the 1994 Federal Acquisition Streamlining Act (FASTA) which focused heavily on contracting reform. Most significantly, the legislation increased the small purchase threshold so the DOD could use simplified contracting procedures for 99 percent of its contract actions. This single action significantly reduced administrative actions and freed up experienced contracting personnel to work on the remaining one percent of contracts which account for 84 percent of the total dollars.⁸ Additionally, FASTA removed some of the impediments which have

restricted the DOD's ability to procure commercial products to meet military requirements by waiving Government-unique legislative requirements.⁹

OSD Reform Initiatives

Current DOD acquisition reform initiatives can be grouped into three major categories. First, the DOD implemented a major reform on military specifications and standards by directing the use of performance based specifications beginning December 26, 1994. If a performance specification cannot meet the user's needs, then a non-governmental standard may be used, and only as a last resort will a military specification be used, with the approval of the milestone decision authority.¹⁰ The second category of reform initiatives is the establishment of a group of programs to serve as test beds for reform initiatives. These programs are given regulatory and/or statutory relief and allowed to use commercial practices to acquire commercial-like items and military-unique items. Programs requiring both statutory and regulatory waivers are termed pilot programs and those only requiring regulatory waivers are designated as lead programs.¹¹

These programs provide test cases for acquisition reform initiatives prior to statutory or regulatory changes being enacted that affect all programs. The final category is reforming the program review and approval process at the OSD and service level. This is being accomplished by using integrated product teams (IPTs) to create a seamless system of parallel program management between government and contractor, while abandoning the old "stovepipe" sequential review. The objective is to get all the players in the Pentagon involved in the program as active team members up front, identifying and resolving problems as they arise, and no longer waiting until major program reviews to

identify major problems.¹² Successfully transforming the Pentagon's army of problem finders and problem makers into problem solvers would be a major step towards fundamental reform.

Air Force Initiatives

Service-level reform efforts are underway to conform with executive, legislative, and DOD direction. This section examines Air Force reform as one example of service-level efforts. Dissatisfied with the pace of acquisition reform, the Air Force's acting Acquisition Executive announced eight "Lightning Bolt" initiatives aimed at radically reforming the way the service runs its acquisition programs. The "Lightning Bolt" initiatives were announced at the conference of USAF Program Managers in May 1995. According to Mrs. Darleen Druyun, the acting Acquisition Executive, these initiatives "are designed to streamline organizations, develop superior acquisition strategies, focus attention on risk management versus risk avoidance, and encourage the use of teaming as an acquisition work force multiplier."¹³ In making the announcement, Mrs. Druyun expressed concern that previous reform efforts had not flowed down and been embraced by all the System Program Offices, and emphasized the need to push Air Force reform efforts to a new level. The eight "Lightning Bolt" initiatives include:¹⁴

1. The establishment of a centralized Request for Proposal (RFP) support team to scrub all RFPs, contracts, and contract modifications over \$10 million.
2. Creation of a standing Acquisition Strategy Panel (ASP) composed of senior level acquisition personnel from SAF/AQ, Air Force Materiel Command (AFMC), and the users.
3. Developing a new System Program Office (SPO) manpower model that uses the tenets established in management of Special Access Required programs.
4. Cancel all AFMC center-level acquisition policies by 1 December 1995.
5. Reinventing the Air Force Senior Acquisition Review Council (AFSARC) process.

6. Enhance the role of past performance in source selection.
7. Replace acquisition documents with the Single Acquisition Management Plan (SAMP).
8. Revise Program Executive Officer and Defense Acquisition Council portfolio review to add a section that deals specifically with acquisition reform.

The Lightning Bolts complement or in some cases simply implement FASTA and OSD initiatives. The schedule for implementation is aggressive; many in fact have already been implemented and the remainder should be implemented by summer 1996.

Advanced Research Project Agency (ARPA)

ARPA is responsible for developing leading edge technologies and transitioning them to the armed services for use in military weapon systems as well as to the commercial sector. Today, many of the best technologies are being developed by the commercial sector, therefore the DOD must leverage commercial technological advances to create military advantage in defense applications. According to Mr. Larry Lynn, Director of ARPA, the agency's goal is to reduce the cycle time and cost of developing and transitioning technologically superior weapon systems to the war fighters by establishing a tighter link to commercial markets.¹⁵ ARPA is pursuing three acquisition reform initiatives to accomplish its goal: technology reinvestment projects (TRP), Maritime Technologies (MARITECH), and the special use of "other transactions" authority.¹⁶

TRPs are competitively selected, cost-shared projects conducted under flexible contracting vehicles, aimed at increasing the DOD's access to affordable, leading edge technology. One category of TRPs is technology demonstrations. Specifically, ARPA is using Advanced Concept Technology Demonstrations (ACTDs) to get war fighters

involved at the earliest phases of the acquisition cycle.¹⁷ “ACTDs allow war fighters to evaluate a technology’s military utility before committing to a major acquisition effort; develop concepts of operations for employing new technology; and retain a low-cost residual operational capability.”¹⁸

“MARITECH is a five year program which is developing and applying advanced technology to improve the competitiveness of the US shipbuilding industry.”¹⁹ The program’s overall objective is to ensure the US will have a competitive domestic shipbuilding infrastructure, capable of building affordable Navy ships whenever new construction tonnage is needed. MARITECH competitively awards federal funds on a cost-shared basis to develop and implement technologies and advanced processes for the design, marketing, production, and support of commercial ships.²⁰ These same technologies and new processes would then be used to build military ships. If successful, MARITECH will integrate military ship building into the commercial ship-building infrastructure.

In 1990, ARPA was authorized to enter into non-procurement, technology development agreements, or “other transactions,” with industry on a cost-sharing basis. “Other transactions” authority permits traditional defense contractors and non-defense contractors to bypass specialized defense contracting rules and use innovative business practices to satisfy defense technology needs. In 1993, ARPA received congressional approval to use the “other transactions” authority for military technology demonstrations and prototype projects for a trial period of three years, without the requirement for cost sharing. In other words, Congress allowed ARPA to bypass Defense contracting rules and establish pilot programs for technology demonstrations and prototype development.²¹

ARPA's first application of "other transactions" authority on a technology demonstration and prototype development is the High Altitude Endurance Unmanned Aerial Vehicle (HAE UAV).²² HAE UAV is an acquisition streamlining pilot program. HAE UAV is planned to provide design-to-cost, long endurance, all weather, wide area imagery coverage directly to the war fighter for a \$10 million unit flyaway price.²³ In addition to relief from contracting rules, industry was given a Statement of Objectives and the leeway to propose system tradeoffs. The only hard requirement is the \$10 million unit price. The program is being managed by an integrated government and contractor team.

Conclusion

This chapter highlighted current acquisition reform efforts within the DOD. The aims of these efforts are commendable; to provide US war fighters the best weapons available, at the cheapest cost, while taking advantage of state of the art technologies. While these efforts are receiving visibility at the highest levels, the majority of changes are within the context of the present system. ARPA's test programs show a willingness on the part of Congress to try something new, albeit on a limited scale, allow innovative thinking by creative managers, and may offer potential inputs to a new system. It must be noted that ARPA's progress has been achieved by circumventing rules within the existing system, and all the lessons learned won't be known until the projects are completed. In addition, the reform efforts highlighted in this chapter were largely focused within DOD. Fundamental changes must be institutionalized not only in DOD, but also by Congress and industry. It is only through the teamwork of DOD, industry, and our legislative

branch that a more efficient and effective weapons procurement process can be developed and implemented.

Notes

¹ (1995, June). Druyun Introduces Radical Changes at AFMC Conference: 8 Lightning Bolt Initiatives To Spark Change at the SPO and the Pentagon. *Air Force Acquisition Reform* [Online], 16 paragraphs. Available HTTP:

http://www.hq.af.mil/SAFAQ/acq_ref/news/June_SE_Newsletter [1995, 25 October].

² Dr William J. Perry, "Acquisition Reform: A Mandate for Change," *Defense Issues* 9, no. 10 (1994): 9.

³ Preston, Colleen. (1995, February). DOD Must Re-engineer Its Procurement System Now. *Defense Issues* [Online], 43 paragraphs. Available HTTP:

<http://www.dtic.dla.mil/defenselink/pubs/di95/di1024.html> [1995, 25 October].

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ Senate, *Report of the Advisory Panel on Streamlining and Codifying the Acquisition Laws: Hearing before the Committee on Armed Services*, 103d Cong., 1st sess., 10 March 1993, 2.

⁸ Preston, Colleen. (1995, February). DOD Must Re-engineer Its Procurement System Now. *Defense Issues* [Online], 43 paragraphs. Available HTTP:

<http://www.dtic.dla.mil/defenselink/pubs/di95/di1024.html> [1995, 25 October].

⁹ Dr William J. Perry, "Acquisition Reform: A Mandate for Change," *Defense Issues* 9, no. 10 (1994): 10.

¹⁰ Preston, Colleen. (1995, February). DOD Must Re-engineer Its Procurement System Now. *Defense Issues* [Online], 43 paragraphs. Available HTTP:

<http://www.dtic.dla.mil/defenselink/pubs/di95/di1024.html> [1995, October].

¹¹ Ibid.

¹² General Viccellio, Henry. (1995, 22 August). A New Era of Acquisition and Sustainment: Remarks to the Society of Logistics Engineers [Online], 66 paragraphs. Available HTTP:

<http://www.dtic.dla.mil:80/cgi-bin/waisgate?WAISdocID=7516618947+1=0+0&WAISaction=retrieve> [1995, October 25].

¹³ (1995, June). Druyun Introduces Radical Changes at AFMC Conference: 8 Lightning Bolt Initiatives to Spark Change at the SPO and the Pentagon. *Air Force Acquisition Reform* [Online], 16 paragraphs. Available HHTTP: http://www.hq.af.mil/SAFAQ/acq_ref/news/June_SE_Newsletter [1995, 25 October].

¹⁴ Ibid.

Notes

¹⁵ (1995, 23 March). Statement by Larry Lynn, Acting Director, ARPA, Before the Subcommittee on National Security, House Appropriations Committee on 23 March 1995 [Online], 99 paragraphs. Available HTTP:

<http://www.arpa.mil/documents/hac/testimony3-21.html> [1995, 25 October].

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ (1995, 28 June). Larry Lynn Name to Head ARPA. Defenselink News Release 357-95 [Online], 10 paragraphs. Available HTTP:

<http://www.dtic.dla.mil:80/defenselink/news/Jun95/b062895bt357-95.html> [1995, 25 October].

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ Ibid.

Chapter 6

A Look to the Future

Excellence in defense management will not and can not emerge by legislation or directive. Excellence requires the opposite—responsibility and authority placed firmly in the hands of those at the working level, who have the knowledge and enthusiasm for the tasks at hand.¹

—Blue Ribbon Commission on Defense Management (1986)

Introduction

In the previous chapters, we discussed the current acquisition system, problems with the system, past successful acquisition programs, and current reform efforts. In the second half of this paper, we will propose changes to the acquisition system. While not addressing every facet of the system, our efforts are focused on the acquisition centers of gravity (COG).^{*} These areas were identified by the research team as the acquisition management processes, the requirements generation process, and the congressional oversight and resource allocation processes. The working hypothesis of the team was that fundamental and radical changes in the above processes could produce cascading effects throughout the system that would result in the Revolution in Military Affairs that Colonel Warden's vision demands.

The problems identified in chapter three served as the basis for the COG selections. Specifically, innovation in the three selected processes must address the four problem areas identified: (1) laws and regulations, (2) military specifications and standards, (3) program instability, (4) and government bureaucracy. The research on lessons learned and current reforms summarized in chapters four and five provided a starting point in defining potential innovations to the three COG processes. The following sections provide the teams recommended innovations in each process and the potential impact of these innovations.

Organization

The initial critical process requiring radical change to effect our revolution in defense acquisition is that of acquisition management. The defense acquisition organization for the 21st century must effectively and efficiently deliver new weapon systems that fully exploit emerging technologies. The plethora of reform efforts discussed in chapter five testify to the widespread recognition of the failure of the current system to meet the needs of all constituents. However, while these efforts testify to the need for change, they have not gone far enough. They are limited by a continued reliance on outdated assumptions and a ingrained organizational and political culture. The challenges to reduce cost, shrink the bureaucracy, shorten the development cycle, and enable innovation in defense acquisition demand radical changes based on new assumptions.

Many of the problems identified in chapter three result from a control-oriented hierarchy. Excessive oversight and reporting requirements, detailed specifications

and standards, intrusive laws and regulations, as well as much of the government bureaucracy are all results of this orientation. The foundation of the current approach must lie in fundamental assumptions about people and their role in the organization. Gerald M. Hoffman, in his book, *The Technology Payoff: How to Profit With Empowered Workers in the Information Age*, asserts that the old assumptions about people, that workers are only interested in getting “maximum pay for minimum work and don’t care about the success of the enterprise,” are outdated.² New assumptions are required to accurately reflect reality. Hoffman claims that reality is, “the people in the organization are smart, proud, knowledgeable about their jobs, concerned about results, and committed to the success of the enterprise.”³ Our proposals accept these new assumptions and challenge others to accept them. The basic objective of our organization change is to “maximize the span-of-no-control,” a term Hoffman uses to describe the organization of the future which maximizes the “range of actions individuals and teams can take without reference to higher authority.”⁴

The program manager (PM) was selected as the initial target for thinking about reform because he or she is the first person in the chain of command, working from the bottom up, that has direct influence over all aspects of the program. In other words, the program manager is responsible for execution. In order to maximize the span-of-no-control, the first reform tenet must be to fully empower program managers. It is important to highlight the revolutionary nature of the intended meaning of the word empowerment. Empowerment is a preeminent human enabler, the benefits of which were first proven by Robert Ford in field studies at AT&T in the 1960s.⁵ The success stories discussed in chapter four highlight this theme, giving the

program manager nearly complete autonomy in the execution of his or her duties. Additionally, the on-going reform efforts echo the importance of this principle, though they fail to embrace it fully. Despite academic and practical evidence regarding the virtues of empowerment, DOD and Congress are reluctant to accept the new assumptions about people and their role in the organization necessary to implement empowerment in its broadest sense. This reluctance to embrace the concept of empowerment is exhibited in the recommendations of the Oversight and Review Process Action Team (PAT), chartered by the Deputy Under Secretary of Defense (Acquisition Reform). The team recommended reducing oversight personnel and costs by fifty percent as a “stretch” goal - something that can’t be achieved today, but might be achieved in the future.⁶ Accepting a reduction of only fifty percent is evidence that old assumptions are still in play while “we remain prisoners of the system and our own thoughts.”⁷ The objective of maximizing the span-of-no-control demands that the broadest possible interpretation of empowerment be embraced. The following discussion will illuminate our intent.

Once a decision is made to establish a program to acquire a new combat capability, a PM will be selected and given complete responsibility and authority for managing the program. The PM will be given the necessary resources in the form of personnel from the Services and funds from Congress, and the authority to use his experience and best judgment to employ them, consistent with public law, to accomplish program objectives. Program managers will have the authority to select and replace the members of the program office, including the ability to hire outside expertise when it is not available within the government. Succinctly, the PM will be

the ultimate and specific accountable authority for delivering combat capability to the war fighter and the judicious use of taxpayer funds.

While this concept represents a radical departure from the system of limited authority and diffused accountability we have today, it is by no means completely untested. Mr. Johnson and the missile program managers discussed in chapter four had similar authority and direct accountability. A current example is available in the following analogy. Today, with the full support of the American people, we entrust operational military commanders throughout the Armed Forces with the lives of thousands of troops and billions of dollars of equipment, including nuclear weapons. Clearly, the new assumptions have been accepted and advocated with respect to force employment. It is time for DOD and Congress, to accept the reality about people, and support empowering a program manager to run a multi-billion dollar acquisition program without the stifling rules, regulations, micromanagement, and oversight that currently exists.

The second tenet for our acquisition organization is teamwork. Nowhere is teamwork more important than in the relationship between government and industry. Our ability to rapidly turn new technologies into cost effective defense systems is tied directly to our ability to forge new working relationships with industry. It requires that we clearly define the roles of all team members, develop trust and mutual respect, and focus on our common objectives. Again, past acquisition programs demonstrate that teamwork was a key to success and it will be for future programs as well.

Our concept of teamwork envisions a single integrated program team (IPT) composed of government and contractor personnel, with each group contributing

complementary core competencies.* According to Hoffman, “the lesson we learned in the 1990s is that you don’t have to perform all business processes yourself provided you perform a few core processes and provided you establish appropriate relationships with other organizations that perform their core processes very well.”⁸ By working together and developing core competencies, the alliance reduces overhead while improving communication and understanding. Such an alliance is overdue and represents a significant radical departure from current government-contractor relations. Colleen Preston, DUSD(AR), recently supported this concept by commenting “We need to be out of the business of inspecting products and contractors, period.”⁹ It is important to highlight the differences between existing IPTs and the IPT concept being recommended by this research team. Current IPTs merely combine government functional expertise under the program manager. The proposed IPT concept applies in its broadest sense. That is, the contractor and the government form an alliance, working together toward a common objective.

The primary role of government team members is to define and communicate system requirements in terms of what capability the system must provide, *not* how the system must be built. Additionally, government team members are charged with acquiring funding; establishing and administering contracts; conducting tradeoffs between cost, schedule, and performance; and assessing the contractor’s cost, schedule, and technical performance. Rather than dictating how the contractor’s business, engineering, and manufacturing systems work, government team members will learn the contractor’s system and interpret the data they provide. When technical and business issues arise, government team members will be evaluated on how well

they work with their contractor counterparts to quickly find solutions. In other words, the focus will be on finding solutions and delivering new combat capability, not on identifying problems and assessing blame.

To accomplish these tasks, the program office must employ a small, highly trained core of acquisition professionals including project managers, contracting officers, finance and budget officers, systems engineers, test engineers, and logistics managers. In essence, the program manager's team must have all the functional expertise required to make informed and timely program decisions without having to rely on outside organizations with differing priorities and objectives. The government team must also include user liaisons; representatives of the war fighting organizations that work alongside government and contractor team members. The user liaisons provide operational insight to development decisions that will impact mission capability.

The contractors' team members will be responsible for using their knowledge, skill and creativity to design, develop, and manufacture a system that meets the customer's needs. The contractor team will also be headed by a program manager who is delegated practically complete control of his program like Kelly Johnson advocated in his basic operating rules described in chapter four.

Once the new vision of the empowered PM and IPT is accepted, the ramifications will ripple through the defense establishment. The roles of senior managers will shift from away from program management and oversight back to broad defense policy issues. Staffs will dwindle as the need for processing large amounts of control-related information ceases. Restrictive controls implemented through expansive regulations,

specifications, and standards will be replaced with “best” practices. The structured milestone review process could be abandoned in favor of flexible strategies developed by each PM and IPT that would be program specific. Without the burden of artificial schedule constraints and limitations, the team will be able to construct strategy-to-task plans and schedules that reflect technology maturity, focus on risk management versus risk avoidance, and enable mid-stream incorporation of innovations. This brief look at the cascading effects expected from the proposed changes provides only a glimpse of the overall impact expected. The PM and IPT concept advocated will resolve the problems discussed in chapter three and create an environment conducive to innovation and shortened development cycles.

Conclusion

Now is the time to radically change the acquisition organization. We must change the way we view people and their role in the organization. The program manager and the program office team is the heart of the acquisition system. This organization must be built around an empowered PM with ultimate authority for managing the program, and a small, integrated government and contractor team committed to rapidly delivering new combat capability. If we accept these tenets and new assumptions we can create an efficient organization poised to meet challenges beyond the 21st century. However, to fully realize our vision, the requirements generation process and the relationship between the DOD and Congress must also be amended to leverage the expected potential of the empowered program manager and integrated product team.

Notes

¹ Department of Defense, *A Quest for Excellence - Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), xii.

* The term *centers of gravity* represents critical elements of the acquisition system which, if changed, could reasonably be expected to produce cascading or "amplified" effects throughout the system.

² Gerald M. Hoffman, *The Technology Payoff: How to Profit With Empowered Workers in the Information Age* (New York: Richard D. Irwin, Inc., 1994), 39.

³ Ibid.

⁴ Ibid., 40.

⁵ Robert N. Ford, "Motivation Through the Work Itself" in Gregory M. Hoffman, *The Technology Payoff* (New York: Richard D. Irwin., 1994), 30.

⁶ Lieutenant Colonel Wesley A. Ballenger, Jr., "Acquisition Reform: Where We've Been; Current Legislation and Initiatives; and Where We're Going," 1995 Executive Research Project no. F4 (Fort McNair, Washington D.C.: Industrial College of the Armed Forces, National Defense University, 1995), 16.

⁷ Peter M. Senge, *The Fifth Discipline* (New York: Bantam Doubleday Dell Publishing Group, Inc., 1990), 27.

* The term *core competencies* refers to those skills or disciplines at which an organization must excel in order to be successful. Through alliances between organizations it is not necessary, or even desirable, for a single organization to develop and possess competencies in all areas.

⁸ General M. Hoffman, *The Technology Payoff: How to Profit With Empowered Workers in the Information Age* (New York: Richard D. Irwin, Inc., 1994), 28.

⁹ Preston, Colleen (1995, February). DoD Must Re-engineer Its Procurement System Now. Defense Issues [Online], 43 paragraphs. Available HTTP:

<http://www.dtic.dla.mil/defenselink/pubs/di95/di1024.html> [1995, 25 October].

Chapter 7

Requirements Generation Process

If we would only put our resources into research and development of leap-ahead technologies, we would be unstoppable. No one could catch us.¹

—Gen Charles C. Krulak
Commandant, United States Marine Corps

Introduction

The second critical process needing improvement is the requirements generation process. Our overarching vision is to conceptualize a defense acquisition system that meets war fighters needs faster, with innovation, and at an overall lower cost than allowed by the system currently in use. All new weapon system acquisitions begin with the definition of a need, that is, an understanding of “what” the system is supposed to do. The challenges of setting and then meeting user requirements are the greatest drivers of cost, schedule, and performance objectives for a program. The requirements generation process is integral to the innovations envisioned in our new acquisition process. Though it is not our intent to redesign the entire requirements process we will recommend changes that enable fulfillment of the vision driving the changes in the acquisition management processes. As such, we have focused on the

way requirements are specified and how technology insertion and innovation can be facilitated during requirements generation.

Requirements Pull

Real or perceived threats have historically been a prime source for generating new war-fighting requirements. Weapons research or the perception of ongoing research by an adversary has sometimes led countries to pursue counters to a potential technology. For example, the perfection of reactive armor by the former Soviet Union was a counter to the shaped charge chemical penetrators fielded by the US to destroy Soviet tanks. In other words, there are military needs or shortfalls that exist independent of technology and within an existing doctrinal system. These needs are identified as part of the Mission Area Analysis and are documented in a Mission Need Statement (MNS). This represents what is often referred to as “requirements-pull.” Figure 2 graphically depicts this process.²

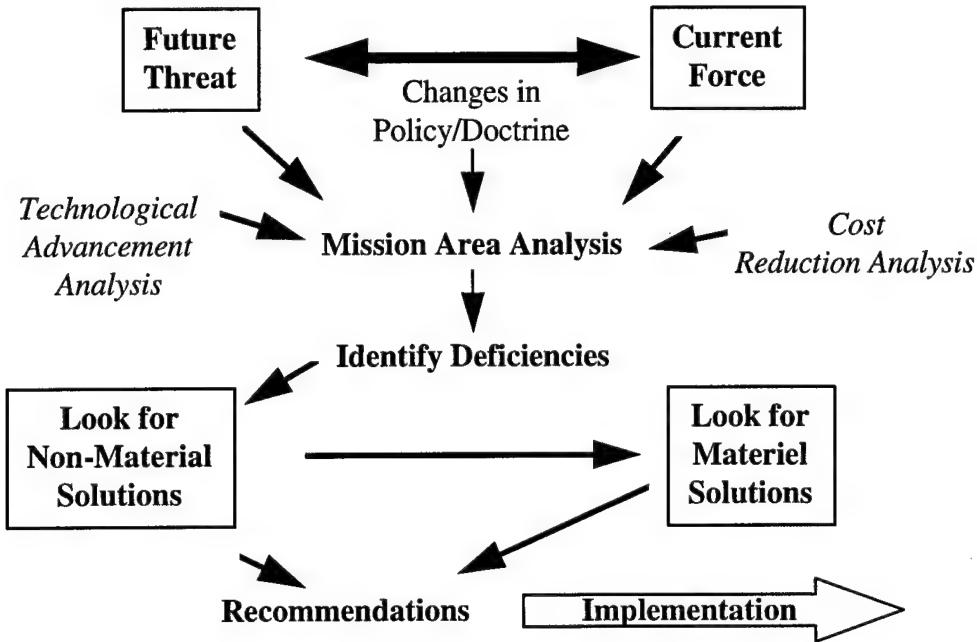


Figure 2. Requirements Generation

Requirements-pull represents the dominant mechanism today, where the need precedes the solution. While this process does not necessarily preclude innovation, it certainly limits it. A broadly scoped MNS is prepared that describes “what” needs to be done and provides limited information on “how” it is to be done. At the conclusion of the requirements generation process, an Operational Requirements Document (ORD) is produced based on the MNS and provided as input to product development activities. Figure 3 traces the requirements generation flow-down process.

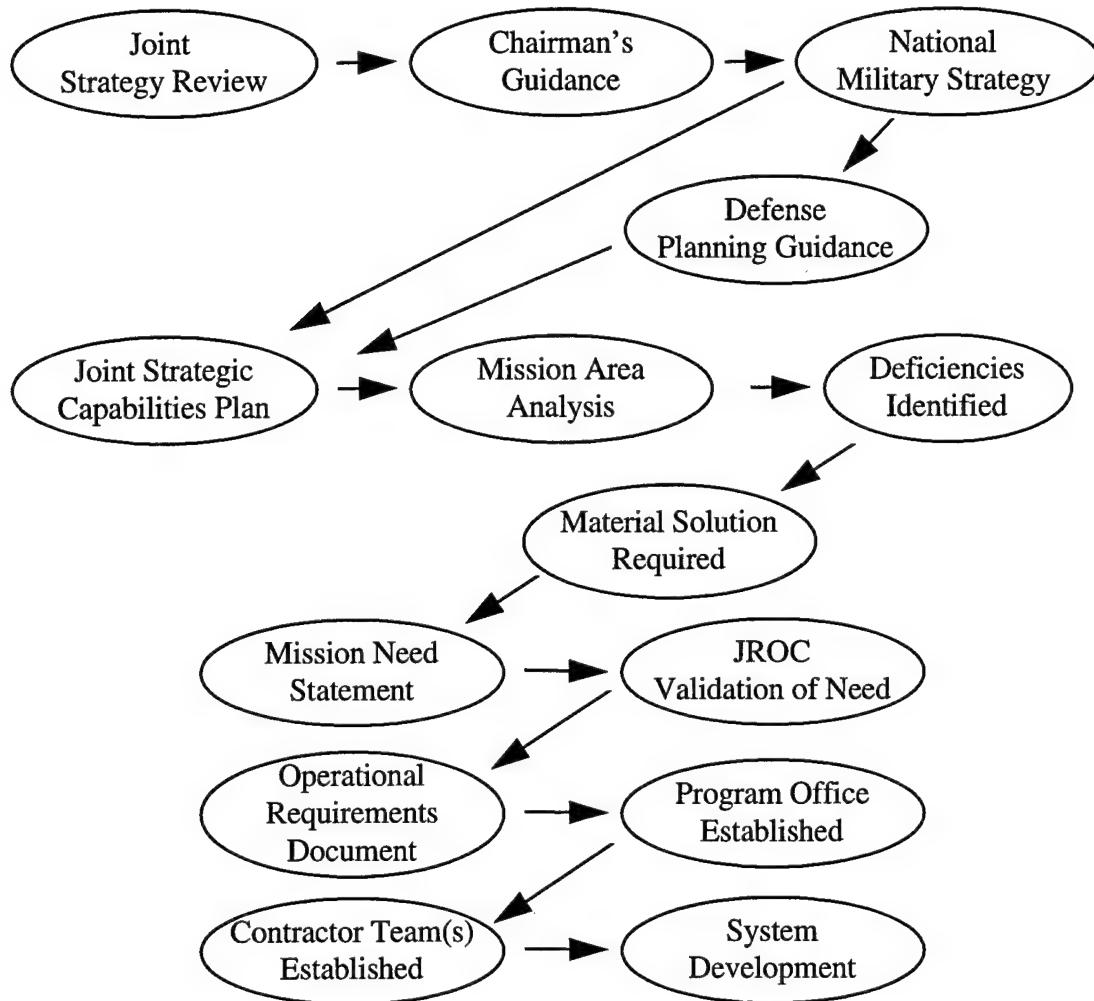


Figure 3. Current Requirements Generation Process

It provides insight into how system requirements become fixed before developers can conduct a tradeoff analysis. The ORD defines system requirements and characteristics that impose a high degree of system definition at the outset. The ability of the weapon system development activity to take advantage of advanced technology, thus enabling truly innovative solutions, is thereby limited. Even in a requirements-pull situation, DOD can enable innovation by beginning weapon system development activities based on the MNS. This approach provides the integrated product team (IPT) with a broad objective and maximum flexibility. This flexibility

enables the IPT to take advantage of the scientific research and technology development efforts within DOD and the civilian communities, facilitating technology insertion. However, this flexibility imposes the requirement for the customers (war fighters) to become full-time participants in the process, as IPT members. The purpose of detailed ORDs is to ensure user operational requirements are met. Our new organization structure will have user representatives as IPT members which will assure operational considerations are addressed, not through innovation-limiting up front constraints, but through iterative dialogue throughout the design process with the experts responsible for developing the weapon system.

The approach recommended above, not only facilitates technology insertion and innovation, but also helps control overall program cost by minimizing requirements creep and enabling users to understand, in "real time," the cost-benefit ratio of individual system requirements. At least one report estimated that small reductions in performance requirements could save 30 percent or more in program costs.³ Providing the IPT with a broader statement of "what" the mission is, coupled with the addition of user representatives on the IPT should enhance the ability to provide for technology insertion and innovation even in requirements-pull scenarios and result in reduced cost.

The above discussion centered on the requirements generation process, as it interacts with the acquisition management process, and suggested an alternative view on defining requirements. While these recommendations will foster innovation within the IPT, they don't complete the revolution needed to fulfill Colonel Warden's challenge of exploiting emerging military technical revolutions.^{*5} Burgleman and

Maidique, in their book *Strategic Management of Technology and Innovation*, suggest that we must “...become more aware of the critical role of technology in strategic decisions, and of integrating them into our strategic management process.”⁶ It is necessary to focus, specifically, on the enabling process that “serves to embody technology into new products.”⁷

A Balanced Approach

In order to address the challenge of integrating technology into our strategic decision making process, the second link between technology and mission needs must be explored. Previously, requirements-pull was discussed. The second concept can be described as “technology-push.” In this scenario, new technology developments precede need identification. In fact, the potential offered by a new technology may precipitate identification of a “need” that did not previously exist. In other words, the technology fundamentally alters the way we approach a particular military mission or even creates new missions.

Entrepreneurship

Unlike requirements-pull, technology-push scenarios are challenging in that there is no fixed point from which to proceed. In the technology-push scenario, the need is not defined and the standard criterion for narrowing the technological portfolio do not apply. Therefore, another concept must be introduced when moving from the technology to the need. Burgelman and Maidique call this concept, *entrepreneurship*, and define it as “activities involved in creating new resource combinations that did not exist before.”⁸ “It involves both the capacity to *identify* opportunities for

combining resources in a novel and militarily viable way and the capacity to *exploit* such opportunities by deploying resources to capitalize on the opportunities.”⁹ Exploitation capability is currently in place within the existing DOD acquisition system. Additionally, the recommendations in this paper as well as those implemented by previous reform efforts serve to improve the system. It is the capacity to identify opportunities that is the focus of the following discussion.

Innovation in the requirements generation process cannot guarantee entrepreneurship. Clearly, entrepreneurship is a creative process and is “serendipitous in nature, and thus very difficult to organize and predict.”¹⁰ Process innovation can, however, create an environment that maximizes the opportunities to identify enabling technologies and establish a creative link to military capability. The needed elements are present within the acquisition system. These elements include research and technology development activities (government and civilian), product development activities, and mission need development activities. The challenge is to coordinate these capabilities in a meaningful way.

To integrate technology into the DOD strategic decision making process we propose to establish links that bring technology sources together with operational users in working level forums and to provide a mechanism for introducing the resulting innovative ideas into the DOD planning process. The purpose of this interaction is to foster innovative application of technology towards military missions. In other words, the technology experts in a given area are linked with operational planners and operators who understand the US National Security Strategy and National Military Strategy.

This research team proposes that the Joint Warfighting Capabilities Assessment (JWCA) teams under the expanded Joint Requirements Oversight Council (JROC) be augmented to provide the leadership in this effort. These teams are already staffed to provide joint warfare capability assessments in nine areas of war fighting and readiness. This approach will further reduce parochialism in DOD and contribute to the “jointness” of any recommendations. Figure 4 illustrates how the process can be modified to better promote technology “push” as well as technology “pull.”

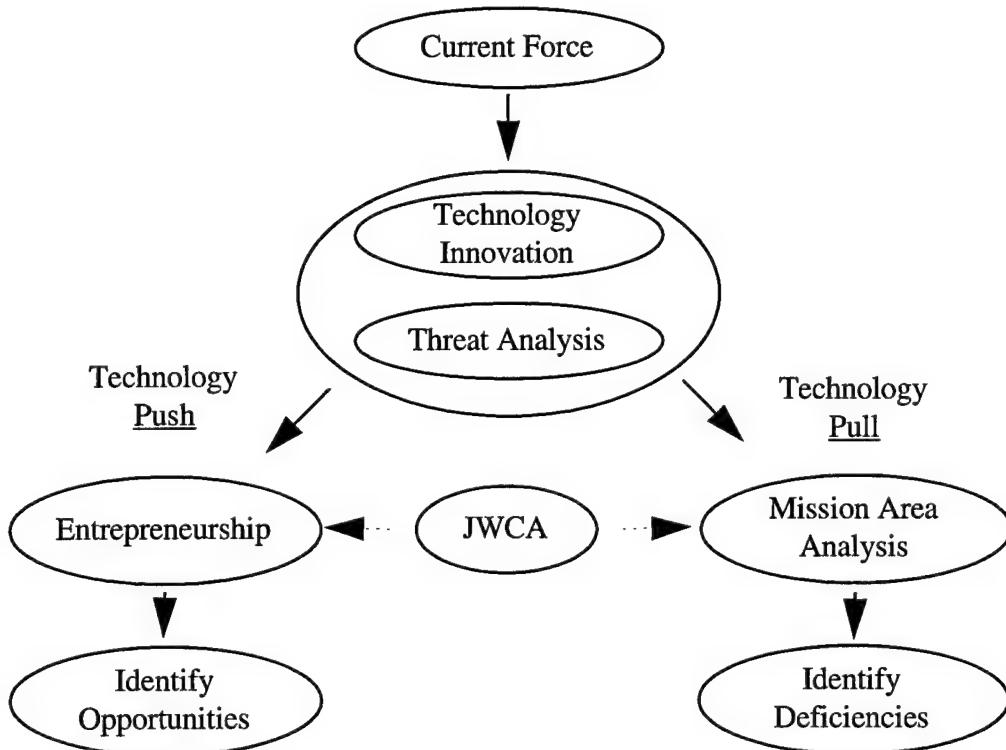


Figure 4. Proposed Requirements Generation Process

To fulfill this additional mission, a small increase in assigned staff will be necessary and will function as the JWCA teams currently do. The resident staff will be augmented by the services, unified staffs, and OSD staff, as needed, to provide expertise regarding the focus for an issue. Each team's resident staff should include

senior acquisition and laboratory personnel to facilitate coordination and interaction with the Government Laboratories and service acquisition agencies. Government laboratories as well acquisition agencies in each service can assist the Joint Staff in establishing and administering the process.

Technology Fairs

One potential mechanism for this linkage might be technology fairs sponsored by the Joint Staff where each functional JWCA team can be exposed to the current state of technological development. When an opportunity is identified, it would be briefed to the JROC with the sponsorship of the JWCA team. Several possible decisions can result. For example, the concept could be approved by the JROC and included in the Chairman's Program Recommendation to the Secretary of Defense and, ultimately, funded and pursued by an IPT. The technology could be deemed too immature for application by an IPT, but still be very promising. A compilation of these promising technologies would become the basis for a technology roadmap that would be issued to the DOD laboratory commanders and subsequently flowed to industry. A third possible outcome is the JROC would determine, for whatever reason, that a concept is not worth pursuing. Technology fairs could be scheduled once or twice a year and each service could be assigned the sponsorship lead on a rotational basis. Attendance at the technology fairs would not be limited to the JWCA teams and augmentees. Each Service could send additional representation as desired. These representatives would be afforded the opportunity to submit "new-start" white papers to the appropriate JWCA team annually. This approach expands the opportunity that an enabling technology will be identified and a creative link established. The actual

mechanics of the interaction can be evolved over time and industry support will build annually as the potential benefits become apparent. The key is to provide the link between the technology experts and the military experts necessary to foster innovation and to make this link as broadly available as possible.

Enabling Strategies

A technology which offers the promise of enhancing the ability to couple technologies and missions, and assist the JWCA teams, involves computer generated simulation and modeling. Modeling can help identify high payoff technologies for development. The US Army is experimenting with “battle laboratories” which are used by various specialties to model battlefields of the future. This technology offers users the opportunity to experiment, at very low cost, with new technologies and organizational structures. These scenarios simulate expected or possible military employment, and can provide quantifiable evidence as to what requirements are most critical for the short, medium, and long-term viability of that specialty.¹¹

Since the early 1980s, sophisticated computer modeling has been useful in the early evaluation of emerging system capabilities against prescribed requirements. The proliferation of self targeting or “smart” munitions in the 1980s was partly due to the advantages demonstrated by such weapons in numerous computer war games.

Rapid prototyping of capabilities identified through computer simulation and modeling will allow for limited user testing far earlier in the development cycle than feasible under the current system. The synergy available by combining simulation results with rapid prototyping will greatly enhance our concept of entrepreneurship and the rapid fielding of leap-ahead technologies. Further, the expansion of

computing technology makes it possible to design, build, and evaluate systems solely or mostly on computer terminals.

An emphasis on rapid, iterative prototyping, combined with virtual prototyping of concepts, would facilitate exploitation of leap-ahead technologies which would ensure US battlefield dominance. This approach requires a shift in national strategy to take greater short-term risk to allow diversion of funds from short-term research and development and procurement to long-term enabling technologies. This idea is consistent with our thesis of becoming the threat to which others react. Requirements would be based less upon a threat and more upon high payoff capabilities identified initially at technology fairs, explored conceptually through modeling, and ultimately field tested as prototypes.

Conclusion

Fostering innovation in the acquisition processes necessitates changes in the requirements generation processes. In this section, we discussed the requirements generation system as it exists today and various means of improving the process. Our initial recommendation is to enhance the role of the Mission Needs Statement and diminish the role of the Operational Requirements Document. Specifically, requirements should be specified to allow effective tradeoffs of performance against schedule and cost objectives. Our second recommendation centered on expanding the role of the JWCA and use of technology fairs to foster innovation by enhancing the links between technology and military experts. Our third recommendation was to expand the role of modeling, simulation, and prototyping. These recommendations

are consistent with joint doctrine, provide opportunities for reduced cost, and most importantly, will leverage the creativity and vision of our people.

Notes

¹ Gen Charles C. Krulak, speech to the Air Force Air Command and Staff College, Maxwell AFB, Ala., 16 January 1996.

² Joseph H. Schmoll, *Introduction to Defense Acquisition Management* (Fort Belvoir, Va.: Defense Systems Management College Press, 1993), 21.

³ Comptroller General of the United States, *Report to the Congress: Defense Acquisition: Perspectives on Key Elements for Effective Management* (Washington D.C.: General Accounting Office, May 1990), 39.

⁴ "A *military technical revolution* occurs when the application of new technologies into military systems combines with innovative operational concepts...to alter fundamentally the character and conduct of military operations."

⁵ Andrew F. Krepinevich, Jr., *The Military-Technical Revolution: A Preliminary Assessment*, (Washington D.C.: OSD/Office of Net Assessment, July 1992).

⁶ Robert A. Burgelman and Modesto A. Maidique, *Strategic Management of Technology and Innovation* (Burr Ridge, Ill.: Richard D. Irwin, Inc., 1988), 35.

⁷ Ibid., 105.

⁸ Ibid., 32.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Office of the Chief of Staff of the Army; Director, Louisiana Maneuvers Task Force, *Force XXI . . . America's Army of the 21st Century*, (Fort Monroe, Va.: 15 January 1995), 16.

Chapter 8

DOD and Congress

Excellence in defense management can not be achieved by the numerous management layers, large staffs, and countless regulations in place today. It depends on reducing all these by adhering closely to basic, common-sense principles: giving a few capable people the authority and responsibility to do their job, maintaining short lines of communication, holding people accountable for results.¹

—David Packard
June 1986

Introduction

In the previous two chapters we looked at lower level COGs, namely program management and requirements generation as critical areas within DOD acquisition needing improvement. However, today's acquisition process cannot be fixed by making the lower echelons more and more efficient without doing the same to the bureaucracy that has grown to dominate it. This bureaucracy is the link between Congress and the DOD through the budgeting process. It is important to make implementation level acquisition processes as efficient as possible, but we are also concerned with the ever increasing level of congressional micromanagement of defense. The relationship between Congress and the DOD will be examined from two overlapping perspectives of congressional oversight and reporting, and the budgeting process.

Oversight and Reporting

Bureaucratic oversight can be examined in terms of congressional committee oversight and agency oversight. Committee oversight includes the Armed Services Committee providing legislative oversight, the Defense Appropriations Subcommittees providing fiscal oversight, and the Government Operations Committees providing investigative oversight. According to Dennis D. Riley, in *Controlling the Federal Bureaucracy*, “There is considerable overlap among the three in practice, creating the potential for some real battles among the various committees.”² Unfortunately, acquisition programs are caught in the middle resulting in program delays and rising costs during such battles. “The growing rivalry between the Defense Appropriations Committees and the Armed Forces Committees over the line-item makeup of the defense budget has played a major role in moving congressional review of the defense budget toward narrowly focused financial action on individual items and away from oversight based on operational concepts and military effectiveness.”³ This oversight is extremely inefficient, and unfortunately it is getting worse as oversight has grown to become a central congressional theme. In 1961, 8.2 percent of all legislative hearings were for oversight. By 1983, this percentage had grown to 25.2 percent.⁴ This level of control has forced acquisition program managers to expend more and more of their time justifying every dollar spent while precious, expensive time is lost during debate. The result is management by congressional staffers that are far removed from the program.

Besides direct committee influence, the acquisition process is also subject to numerous governmental oversight agencies. Congress has at its disposal, the Congressional Research Service, the General Accounting Office (GAO), the Office of

Technology Assessment, the Congressional Budget Office, the Inspector General, and the Comptroller's Office. The oversight bogs down the acquisition system and increases costs significantly. According to Vice President Gore's National Performance Review, the DOD employs more than 49,000 procurement personnel and has about 35,000 auditors and accountants working on procurement matters.⁵ The oversight and review process action team charter by Secretary of Defense William J. Perry estimated that the cost of milestone reviews can be as much as \$8-12 million dollars per program.⁶ According to Secretary Perry, the managers in the DOD require large staffs to ensure government unique procedures are followed, and industry matches these staffs on a one-for-one or two-for-one basis. And, the thousands of people involved in that oversight are what is driving up our cost.⁷

To solve the problem of overlapping, excessive oversight agencies, Congress will have to take a hard look at itself. "Meaningful improvement will come not from more regulation but only with major institutional change," according to the Packard Commission Report in 1986.⁸ The Senate agreed in April 1986 when it reported, "congressional reform must extend beyond the confines of defense oversight. Ultimately, fundamental patterns of congressional behavior must change. Committee jurisdictions must be reasserted and tightened to minimize overlap and duplication. Redundant legislative phases of budgeting, authorizing, and appropriating must be consolidated."⁹ We completely agree with these changes and believe Congress should also consider consolidating its agency oversight into one, efficient agency that reports in a standard format to any committee desiring information. The remaining oversight agencies should either be disbanded or at least their oversight responsibility significantly reduced.

As the number of oversight bodies have grown well beyond reason, so to have the corresponding reporting requirements. Such reporting draws the program manager away from his primary task of managing the program and requires a staff of fact gatherers and briefing builders in order to justify the program. For example, the F-16 multi-year contracting approval took 2.5 years and 240 briefings, 1.8 per week to win the support of Congress and Pentagon officials.¹⁰ On a broader scale, “in fiscal year 1993, Congress required executive branch agencies to prepare 5,348 reports. Much of this work is duplicative” according to Vice President Gore’s findings.¹¹

Reduction and simplification are the solution. The Packard Commission identified this in their 1986 report, “Congress should review and make major reductions in the number of reports it asks DOD to prepare and should closely control requirements for new reports in the future.”¹² Vice President Gore reiterated this during the National Performance Review when he observed “one place to start liberating agencies from congressional micromanagement is the issue of reporting requirements. Over the past decades, we have thrown layer upon layer of reporting requirements on federal agencies, creating an almost endless series of required audits, reports, and exhibits.”¹³ Acquisition programs should produce one report per year in a standard format to be reviewed by the appropriate committees along with a central oversight agency’s report. Out of cycle reporting should be required only when a program is deemed to be in trouble by the program manager.

Budget Process

The second half of bureaucratic control that must be altered is congressional micromanagement of defense spending and inefficient budgeting. Table 2 below demonstrates the proliferation in congressional reporting requirements since 1970. As mentioned, this can be attributed to Congress's growing shift from policy oversight toward financial and program management. Financial and programmatic oversight address the efficiency with which funds are spent and how effectively programs are managed.¹⁴ Policy oversight attempts to answer the larger questions of whether particular programs are needed, how they serve the specific missions the Pentagon has delineated, and whether those missions and the strategies they serve are sensible.¹⁵ Congress has increasingly focused on the line items that make up the budget and not whether the defense budget supports national security objectives and whether these objectives are in the best interest of the American people.

The level of congressional management of the defense budget has grown substantially over the past twenty five years. To reverse this trend, the executive branch and Congress have to create an environment where the DOD can operate more like private industry. For this to happen, a long-term planning, programming, and budgeting process has to be created that can logically connect a DOD mission to the President's national security policy. In 1985, the Blue Ribbon Commission on Defense Management stated "...there is a great need for improvement in the way we think through and tie together our security objectives, what we spend to achieve them, and what we decide to buy. The entire undertaking for our nation's defense requires more and better long-range

planning. This will involve concerted action by our professional military, the civilian leadership of the Department of Defense, the President and the Congress.”¹⁶

Table 2. Congressional Reporting Requirements

Authorization and Appropriation Committee Reports			
<u>Fiscal Year</u>	<u># Reports</u>	<u>Fiscal Year</u>	<u># Reports</u>
70	36	88	719
80	231	89	661
81	223	90	861
82	221	91	676
83	325	92	734
84	422	93	654
85	458	94	676
86	676	95	709
87	680		

Source: OSD Under Secretary of Defense (Comptroller)¹⁷

A long-term commitment toward planning and budgeting by both Congress and the DOD is required. Central to taking a longer view of resource allocation is the concept of “multi-year budgeting.” This idea was also expressed in the 1985 Blue Ribbon Commission on Defense Management:

Of greater concern, congressional approval of the budget on a year-to-year basis contributes to and reinforces the Department’s own historical penchant for defense management by fits and starts. Anticipated defense dollars are always in flux. Individual programs must be hastily and repeatedly accommodated to shifting overall budgets, irrespective of military strategy and planning. The net effect of this living day-to-day is less defense and more cost. Although often hidden, this effect is significant - and it can be avoided.¹⁸

Congress can achieve this long-term perspective and provide the needed fiscal stability through multi-year authorizations and biennial appropriations.

Multi-year authorizations require Congress to approve the defense budget on a long-term basis (e.g. three, four, or five years). Biennial appropriations would provide DOD two years of funds to implement the approved defense budget. This budgeting change

complements the milestone decision process of the current system that we described in chapter two. Congress could only review and authorize selected weapon system programs at critical decision points in the acquisition cycle. Once Congress has authorized the initiation of a program, formal reviews and authorization to proceed would occur only at successive milestones. The benefits include: Congress retains the final say over milestone decisions, it enhances stability by changing from an annual “line-item” mentality to a long term view, and it removes committees from detailed management.¹⁹

Conclusion

Improving today’s acquisition process requires changes within DOD and in the relationship between DOD and Congress. As Mr. Packard stated in 1986, “Excellence in defense management cannot be achieved by the numerous management layers, large staffs, and countless regulations in place today.”²⁰ Congressional oversight, reporting requirements, and the budgeting process must be carefully inspected for legitimacy and those areas that do not meet a common sense standard must be removed, reduced, or simplified. This process can be improved by implementing the recommendations presented in this chapter: (1) reducing committee overlap in Congress and consolidating congressional oversight agencies; (2) reducing acquisition program reporting to once per year and at each milestone decision; (3) and adopting a long range planning and budgeting process by implementing multi-year budgeting and appropriations. Collectively, these changes will move Congress out of detailed management and back toward policy oversight and furnish a systematic approach for DOD to provide program information to Congress. Also, these changes will significantly improve the relationship

between Congress and DOD while providing a more stable, efficient, and effective acquisition system.

Notes

¹ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), xiii.

² Dennis D. Riley, *Controlling the Federal Bureaucracy*, (Philadelphia, Pa.: Temple University Press, 1987), 69.

³ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), 21.

⁴ William F. West, *Controlling the Bureaucracy: Institutional Constraints in Theory and Practice* (New York: ME Sharpe Publishing., 1995), 140.

⁵ William H. Gregory, "Buyers Beware," *Government Executive* 26, no. 4 (April 1994): 33.

⁶ Lieutenant Colonel Wesley A. Ballenger, Jr., *Acquisition Reform: Where We've Been; Current Legislation and Initiatives; and Where We're Going*, 1995 Executive Research Project no. F4 (Fort McNair, Washington D.C.: The Industrial College of the Armed Forces, National Defense University, 1995), 16.

⁷ William J. Perry, "Three Barriers to Major Defense Acquisition Reform," *Defense Issues* 1 (1994): 94.

⁸ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), xxiv.

⁹ *Ibid.*, 24.

¹⁰ William H. Gregory, *The Procurement Mess* (New York: Viking Press, 1989), 29.

¹¹ Vice President Al Gore, *The Gore Report on Reinventing Government* (Washington D.C.: Government Printing Office, 1993), 34.

¹² Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), 29.

¹³ Vice President Al Gore, *The Gore Report on Reinventing Government* (Washington D.C.: Government Printing Office, 1993), 34.

¹⁴ R. J. Art, "Congress and the Defense Budget: Enhancing Policy Oversight," *Political Science Quarterly* 100, no. 2 (1985): 235.

¹⁵ *Ibid.*

¹⁶ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), xvii.

Notes

¹⁷ Briefing, OSD Under Secretary of Defense (Comptroller), Subject: Authorization and Appropriation Committee Reports, Washington D.C., 7 February 1996.

¹⁸ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), 25.

¹⁹ R. J. Art, "Congress and the Defense Budget: Enhancing Policy Oversight," *Political Science Quarterly* 100, no. 2 (1985), 247.

²⁰ Department of Defense, *A Quest for Excellence—Final Report to the President*, the President's Blue Ribbon Commission on Defense Management (Washington D.C.: Government Printing Office, June 1986), 12.

Chapter 9

Conclusion and Recommendations

During the Second Wave era, military technology in the United States advanced at lightning speed and spun off innovation after innovation into the civilian economy. Today a role reversal has occurred. In the fast paced Third Wave economy, technical breakthroughs come faster in the civilian sector and spin off into the defense industries. This calls for a strategic reexamination of R&D priorities and a restructuring of relations. . . .¹

—Alvin and Heidi Toffler
War and Anti-War

The research paper portrays an inefficient bureaucratic, hierarchical defense organization, operating in an environment populated by a myriad of rules and regulations aimed at controlling and directing the actions of program managers (PMs). The on-going reform efforts within DOD testify to the need for change but fail to confront, head on, the root causes of problems. In most cases, these reforms have been implemented within the boundaries of the existing structure and culture. They take the first few steps toward the future but they shy away from a single, bold leap. This represents the fundamental difference between the recommendations contained herein and previous reform efforts. The revolution in defense acquisition affairs is not embodied in the concepts themselves. The basic concepts are not new. Rather, the revolution will only manifest itself when DOD and Congress embrace a new *Weltanschauung*, or world view, that fully embraces

those concepts in their broadest sense. To achieve the fundamental and revolutionary changes in defense acquisition needed to transform the current bureaucracy into an organization that can effectively and efficiently exploit emerging military technical revolutions, basic assumptions about people and their role in the organization must be changed. The *Weltanschauung* advocated is characterized below:

1. PMs fully empowered to manage their programs. PMs responsible to war fighters for delivering combat capability and responsible to Congress for stewardship of public funds. A PM that is not responsible to anyone else.
2. Integrated Product Teams (IPTs) with contractors, government personnel, and war fighters working together toward a common objective, free from restricting rules and regulations, and able to develop flexible, program specific strategies to meet the objective. A team free to pursue innovations in both processes and products. A team where members don't watch each other, but where complementary core competencies come together to eliminate duplication and pursue "best" practices.
3. An environment where both DOD and Congress trust that the PM and IPT are dedicated to program success and stewardship of public funds, and where PM's are held personally accountable for violations of that trust. An environment where there are no oversight agencies beyond the General Accounting Office.
4. A requirements process using an expanded Joint Warfighting Capabilities Assessment process to identify revolutionary technologies and ensure that programs are consistent with the National Military Strategy (NMS). A process that maximizes the use of simulation to explore evolving technologies and military applications. A process where the Mission Needs Statement provides broad guidance to the PM and IPT, and where the war fighting community actively participates as members of the IPT to ensure mission needs are met.
5. A Congress that provides stable, reliable funding with multiyear appropriations and assigns a staffer focal point to each program manager who participates in the process.

This *Weltanschauung* provides the foundation from which a revolution in defense acquisition affairs can rise and take the US into the new world of the 21st century. The recommended changes require a shift in culture and revision of assumptions that supported the evolution of the current system. Clearly, the recommended changes have been validated by the examination of lessons learned from past successes, epitomized by several of the Lockheed Skunk Works programs. Additionally, the key management

principles advocated in the recommended changes have been recognized as key ingredients in most of the current reform efforts.

So, why hasn't this world view been adopted? Succinctly, adoption of the advocated *Weltanschauung* on a broad scale exacts a price in terms of loss of control by the executive branch, DOD, and Congress. As Col Warden noted, to make fundamental changes in the current system, we must harness the national will. What promises can the new *Weltanschauung* offer in return for the loss of control exacted from the executive branch, DOD, and Congress?

The new *Weltanschauung* offers the opportunity for reduced cost, shorter development cycles, and improvements in technology insertion. The new world view removes barriers to innovation and leverages the ingenuity and dedication of our people. It provides an environment that fosters linkages between the war fighters and the technology experts and where those links expose opportunity, and the framework for rapid and efficient realization of that opportunity in the form of cost effective weapon systems. In short, it creates a structure and culture that encourages innovation. The preponderance of studies sponsored by the executive branch, DOD, and Congress have all testified to the "cost" of needless oversight and reporting, of excessive regulatory and specification restrictions, and of a bureaucratic, control-oriented structure that is complex and innovation limiting.

Migration Strategy

While this research team cannot compel acceptance of the recommendations provided, a migration or implementation strategy that demonstrates feasibility and

minimizes risk can be proposed. Thomas H. Davenport, in his book *Process Innovation: Reengineering Work through Information Technology*, suggests the goal of prototyping is to gradually shape the organizational environment and proposes prototyping of processes to assist in familiarization with the new process and in risk mitigation.² The ACTDs discussed in chapter five represent a prototypical implementation of many of the key concepts advocated by this research team. For example, the high altitude unmanned aerial vehicle programs exercise five basic principles: an empowered program manager; integrated product teams including government and contractor personnel as well as war fighter representatives; reduced oversight and regulatory control, enabled through Congress's discretionary authorization for ARPA to use the "other agreements authority"; rapid prototyping; and expanded use of the mission need statement. While these programs don't represent a full implementation of all the recommended principles and have been limited to prototype programs, their implementation has demonstrated value. The increasing use of the ACTD process by DOD is evidence of the widespread recognition of this value.

Despite the partial use of prototypes, an abrupt change to the processes for all of DOD would be difficult. Since the process changes will be highly visible, both internally and externally to DOD, a phased introduction may provide a more palatable solution for Congress and DOD. A pilot-program approach is one way to afford Congress the opportunity to accept the new *Weltanschauung* with minimum "cultural" shock, and allow DOD to build trust and demonstrate benefits. With this approach, Congress and DOD could implement the recommended changes for one or two major acquisition

programs and then apply the new processes to more programs as confidence and experience accrue.

As noted earlier, this research team cannot compel others to accept the new *Weltanschauung*, but the preponderance of academic and practical evidence supports adoption of the proposed changes. We all know what needs to be done - let's do it! We echo the words of Gen Sullivan, "...the payoff will go to organizations which are versatile, flexible, and strategically agile, and to leaders who are bold, creative, innovative, and inventive."³ We cannot accept the enormous risk imposed by hesitation.

Notes

¹ Alvin and Heidi Toffler, *War and Anti-War* (New York: Warner Books, Inc., 1993), 167.

² Thomas H. Davenport, *Process Innovation: Reengineering Work through Information Technology* (Boston, Mass.: Harvard Business School Press, 1993), 158.

³ Gen Gordon R. Sullivan in Adm William A. Owens, "The Emerging System of Systems," *US Naval Proceedings* 121 (May 1995).

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